A FUELWOOD STUDY FOR MACKENZIE REGION COMMUNITIES OF THE NORTHWEST TERRITORIES

A FUELWOOD STUDY

FOR MACKENZIE REGION COMMUNITIES

OF THE NORTHWEST TERRITORIES

Prepared for:

N.W.T. ASSOCIATION OF MUNICIPALITIES

Prepared by:

Treeline Planning Services Ltd.
Yellowknife, N.W.T.

March 1985

RCDP/PDCE-73

This report was prepared with a contribution from the Remote Community Demonstration Program of Energy, Mines and Resources Canada (EMR). Distribution of this report by EMR does not necessarily signify that the contents reflect the views and policies of EMR. Mention of trade names and commercial products does not constitute recommendation or endorsement for use.

TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY	vi
RESUME	vii
Chapter 1 - Introduction and Background	1
Chapter 2 - Yellowknife Ownership & Fuel type	2
Chapter 3 - Current, Projected Heating Requirements	4
Chapter 4 - Projected Heating by Sector and Ownership	5
Chapter 5 - Heating for Three Scenarios	7
Chapter 6 - Biomass Energy Equivalent	7
Chapter 7 - Levels of Conversion to Biomass	8
Chapter 8 - Socio-Economic Impacts of Conversion	9
Chapter 9 - Review of two referenced reports	17
Chapter 10 - Conclusions	18
Chapter 11 - General Recommendations	20
Bibliography	21
Appendix A - Notes on Table Development	22
Appendix B - All Tables	27
Appendix C - Extract from GNWT population forecasts	71
Appendix D - Yukon Notice to Residents	72
Appendix E - Pamphlet entitled "... Clear the Air..."	73

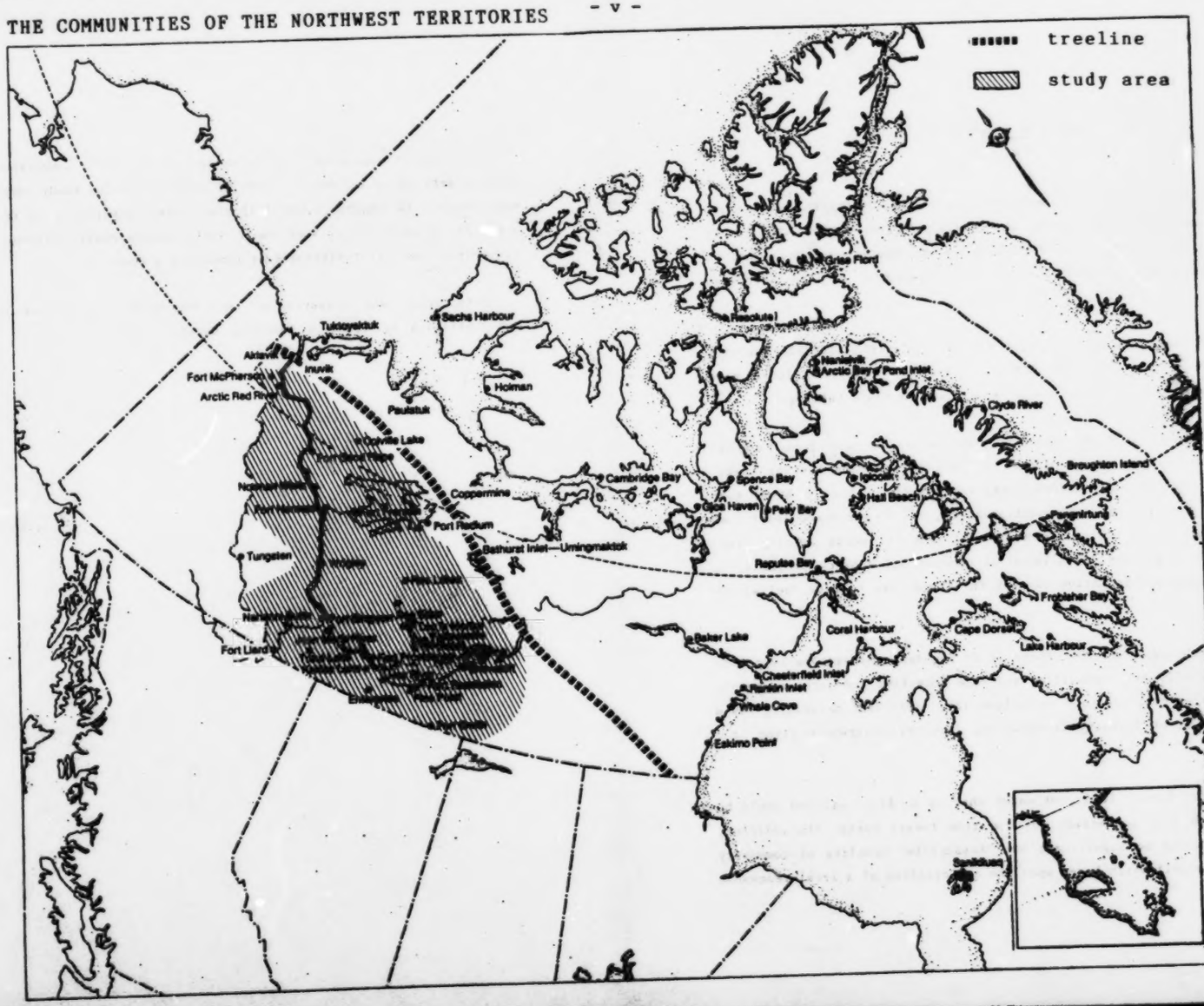
LIST OF TABLES IN APPENDIX B PAGE

Table 1 - Yellowknife Buildings and Ownership (Estimated)... 27
Table 2 - Heating Demands under Three Scenarios..... 28
Table 3 - Heating Demands for 'Cost-Effective' Scenario..... 29
Table 4 - Heating Demand by Use Sector and Ownership..... 30
Table 4A - SAB Fuel Quantities (Gals.) by Use Sector..... 30
Tables 4B to 4E - SAB Breakdown for study time horizons 31
Tables 4-1 to 4-28 - Community Fuel projections by use/owner 33
Table 5 - Building Use Sector and Ownership by Community.... 61
Table 6 - Fuel Oil Projections for all communities..... 62
Table 7 - Wood Projections for all communities..... 62
Table 8 - Propane Projections for all communities..... 63
Table 9 - Biomass Energy Equivalent by community & ownership 64
Table 10 - Biomass Energy Equivalent by community & use..... 65
Table 11 - Same (continued)..... 65
Table 12 - Same (continued)..... 66
Table 13 - Same (continued)..... 66
Table 14 - All Fuels Biomass Energy Equivalent by community. 67
Table 15 - Value of Displaced Fossil Fuels..... 68
Table 16 - Cost of Conversion to Wood Fuel..... 69
Table 17 - Biomass areas & distances by Community..... 69
Table 18 - Employment with Biomass Fuels by Community..... 70

LIST OF ILLUSTRATIONS

	PAGE
Illustration 1 - YK Buildings by Fuel & Ownership.....	2
Illustration 2 - YK Buildings by Fuel Type.....	3
Illustration 3 - Demand Projection by Scenario.....	4
Illustration 4 - Fuel Oil by Use Sector.....	6
Illustration 5 - Conversion to Biomass.....	8
Illustration 6 - Fossil Fuels vs. Wood.....	12
Illustration 7 - Conceptual Cutting Zones.....	13

THE COMMUNITIES OF THE NORTHWEST TERRITORIES



EXECUTIVE SUMMARY

This 1985 Biomass study was undertaken for the Northwest Territories Association of Municipalities, with the financial support of the Remote Community Demonstration Program of Energy, Mines and Resources Canada, and of the Economic Development Secretariat of the Government of the Northwest Territories.

The study continues initiatives begun in the 1982, 1983 and 1984 Building Inventory and Energy Use Surveys (BIEUS). This 1985 exercise looks more carefully at the potential for the use of wood fuels in space heating.

The study concludes that an organized fuel switch to wood from fuel oil could produce considerable opportunities for savings in space heating costs, and for the creation of badly-needed local employment in the 28 study communities. Due to a variety of government policies, oil is the predominant fuel type at the moment. A successful move to wood from oil would require free-market pricing, or a serious curtailment of present oil subsidy programs, in order to provide consumer incentive to seek the lower cost heating fuel alternative.

Initial research indicates that there is an abundant sustainable supply of wood fuel for virtually all communities and some potential for inter-community trade with the larger centres, such as Yellowknife. Efficient harvesting would require the creation of forestry inventories, forestry management plans, and some access routes.

In more specific terms, it is estimated that up to $17.5 million could be saved annually with full conversion to wood from fossil fuels. In addition, it is felt there would be significant but "intangible" benefits of community pride, control, and self-worth based upon the exploitation of a local renewable resource.

In terms of employment, it is estimated that full conversion to wood fuel would create up to 218,000 days of work across the study communities. This would equate to roughly 1,000 full-time jobs. Similarly, it is felt that the activity of using local wood fuels would create small business opportunities for entrepreneurial individuals or community groups.

This study was prepared for the Northwest Territories Association of Municipalities by Treeline Planning Services Ltd.

ÉTUDE DES BESOINS EN BIOCOMBUSTIBLE DANS LES COLLECTIVITÉS DES TERRITOIRES DU NORD-OUEST

Résumé

Cette étude sur la biomasse a été réalisée en 1985 pour l'Association des municipalités des Territoires du Nord-Ouest (T.N.-O.) avec l'appui concret d'Énergie, Mines et Ressources Canada et du Secrétariat au développement économique du gouvernement des T.N.-O. L'étude fait suite aux projets réalisés en 1982, 1983 et 1984 dans le cadre de l'Inventaire des immeubles et examen de leur consommation d'énergie. Le présent document se penche en particulier sur la possibilité d'avoir recours aux combustibles du bois pour le chauffage des locaux.

Selon les conclusions de l'étude, le remplacement du mazout par le bois comme moyen de chauffage pourrait donner de grands avantages: la réduction des coûts liés au chauffage des locaux, et la création d'emplois sur place dont ont grandement besoin les 28 collectivités visées par l'étude. En raison des diverses politiques gouvernementales, le pétrole constitue le type de combustible le plus utilisé actuellement. Pour réussir le remplacement du mazout par le bois, il faudrait procéder à une réduction importante de subventions actuelles relatives au mazout ou déréglementer les prix du pétrole de façon à encourager les consommateurs à rechercher les substituts au mazout les moins coûteux.

Des recherches antérieures démontrent qu'en fait, toutes les collectivités disposent d'une source abondante et soutenue de bois de chauffage et qu'elles pourraient en exporter vers les grands centres, comme Yellowknife. Pour exploiter les forêts de façon efficace, cependant, il faudrait que des plans de gestion soient élaborés et que certaines routes d'accès soient construites.

Pour être plus précis, on évalue à 17,5 millions de dollars le montant qu'il serait possible d'épargner annuellement en remplaçant les combustibles fossiles par le bois. De plus, on croit que les collectivités retireraient des avantages importants, bien qu'impondérables, sous forme de fierté, de contrôle et de valorisation en exploitant une ressource renouvelable locale.

En ce qui concerne l'emploi, on évalue à 218 000 le nombre de jours-personnes que créerait pour les 28 collectivités visées (voir Tableau 18) le remplacement complet du mazout par le bois. Ces chiffres correspondent à environ 1 000 emplois à temps plein.

Énergie, Mines et Ressources Canada a contribué financièrement à la réalisation de cette étude par l'intermédiaire du Programme de démonstration dans les collectivités éloignées. L'étude a été préparé par Treeline Planning Services Ltd.

Chapter 1 - Introduction and Background

In bygone years, wood was the major fuel source for all heating, cooking and transport in the Mackenzie communities. The wood-fueled river steamboats of the Athabaska, Slave, and Mackenzie Rivers plied the inland waterways for a distance of more than 2700 kilometers.

With the influx of Canadian Government North of the Sixtieth Parallel, especially since 1945, came an unconscious but nonetheless real changeover to widespread fuel oil use in space heating and electrical generation. Increased oil use made sense to decision-makers of the time, because it was easier to transport, handle, and use than wood; and because it was less labour-intensive than the traditional wood fuel. A number of oil finds in Western Canada (Leduc, Alberta in 1947) and in the Western NWT (Norman Wells in 1920) made it appear to leaders of the era that oil would probably be plentiful for the foreseeable future.

As the limits of these smaller reserves close to home became more obvious, and the sources of cheap imported oil dried up in the 1970's (with the rise of OPEC, an international cartel of oil-producing nations); prices for all hydrocarbon fuels began to rise steeply, forcing many customers to rethink their energy use. North Americans discovered that their embracing of oil-based

energy had made them dependent and vulnerable.

The NWT Association of Municipalities is an umbrella organization representing the interests of 17 municipalities (approximately 65% of the Territorial population) across the Northwest Territories. The Association is very concerned with the reponses that their members should make to all aspects of energy use in the North; given the cold climate, isolated community locations, and rapidly growing populations. An examination of the potential use of wood for space heating in communities represents an opportunity for the Association to plan for the future of its members South of the treeline.

Although a historical form of heating, the technology surrounding wood heat has changed remarkably in the past fifty years. Tighter (improved air seal) and better insulated buildings, and more efficient fuel burning appliances, have reduced the amounts of energy required to heat a given building in a specific location.

The considerable quantities of biomass growing in the NWT below the treeline, coupled with growing populations and unemployment, give residents and their elected representatives cause to consider the advantages of a new emphasis for wood fuels, while maintaining the comfort and safety of citizens. This study is seen as an early step in that direction. The 28 communities considered in this study are listed in Table 2.

Chapter 2 - Activity 0 - Yellowknife Ownership and Fuel Type

The previous Building Inventory and Energy Use Surveys (BIEUS) of the 1982,1983 and 1984, done for Energy, Mines & Resources Canada, have gathered and organized data on the number and fuel types of buildings found in the Mackenzie River Communities, excluding Yellowknife.

With roughly 40% of the building units and population of the lower Mackenzie Region South of the treeline, it was felt that Yellowknife could not be ignored as part of a general assessment. It was therefore decided that a brief estimation exercise on the number of building units, their ownership, and fuel type should be done before looking into the overall picture for the 28 communities of the BIOMASS study. The outcome of the research is summarized in Table 1; it shows the estimated breakdown for Yellowknife buildings by Ownership and Fuel Type.

Illustration 1 shows the building number breakdown by Ownership/User and Fuel type, in bar chart form. A quick glance reveals that oil is popular across all ownership groups, that the Government Ownership group favours the use of oil-only for space heating energy, and that the Private ownership group leads the way in use of wood.

Illustration 2 shows the "percentage of all units" breakdown by fuel type. Oil-only burners predominate at 59% of

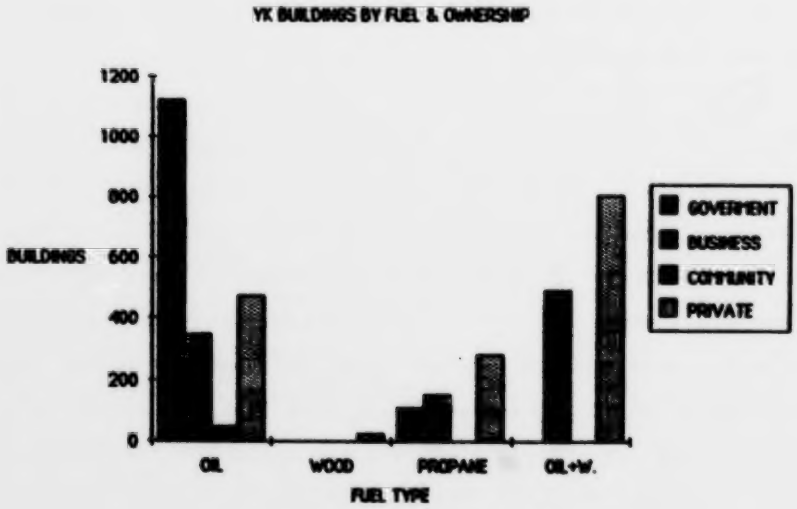


ILLUSTRATION 1

YK BUILDINGS BY FUEL TYPE

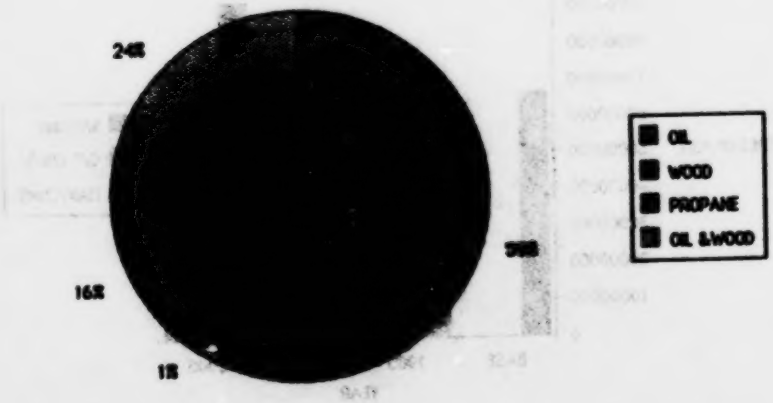


ILLUSTRATION 2

all units, with mixed wood-oil burners making up 24% of this total.

From Table 1, it is clear that the Government ownership group is a major user of oil (at 56% of all oil-only burning units). The Table 1 figures further indicate that a large number of the Private-ownership group use some amount of wood fuels, in order to reduce their overall fuel costs. Having both fuel systems in a given building allows the private owner to i) burn more wood for economy (with additional labour), or ii) burn more fuel oil for reliability in periods of deep cold or unattended appliance operation.

We can conclude from the above that the personal accountability of Private building owner/operators probably motivates their fuel preferences, in spite of the additional effort required to maintain wood-fired heating systems. It would also seem that Government organizations have little motivation to find similar low-cost fueling options, because user-pay or heating performance checks are not in effect.

Chapter 3 - Activity 1 - Current, Projected Heating Requirements

This chapter contains current and projected heating requirements expressed in litre quantities of fuel oil. The small amounts of propane and wood used were considered to be negligible for purposes of this exercise.

In Table 2, projected heating demands were prepared for three possible scenarios: "Without Conservation", "Cost-effective Conservation", and "Maximum Conservation". Each of these scenarios was calculated for three separate time horizon years: 1985,1995, and 2005; spanning the study forecast period of the present to the year 2005 A.D. The bottom-line results are summarized graphically in Illustration 3 entitled "Demand Projection by Scenario".

Table 2 methodology involved calculating per capita fuel consumptions for current years, and then calculating proportional increases based upon GNWT population forecasts for the three horizon years. See extract from GNWT population forecasts in Appendix C of this document. For further detail on the methodology of these tables, see the Notes on the Development of Tables 2 & 3 in Appendix A of this document.

Burning fuel at current per capita rates of consumption, fuel oil demand would rise from 66 to 92 million litres. If a "cost-effective conservation" approach were to be followed, we

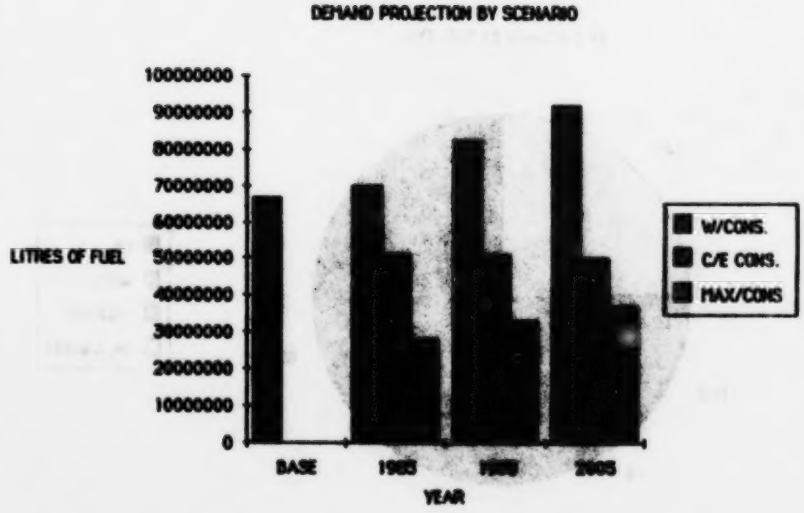


ILLUSTRATION 3

could look forward to a constant 51 million litre demand. A "maximum conservation" effort, (explained in the Notes on Development of Tables 2 & 3 in Appendix A), would allow the study area to be heated with 28 to 37 million litres.

We can conclude that with cost-effective conservation, it is both reasonable and possible for the Mackenzie region to simultaneously experience space heating fuel reductions of about 20%, while absorbing forecast population rises beyond the turn of the century.

Chapter 4 - Activity 2 - Projected Heating by Sec[illegible]hip

This study portion projects heating fuel requirements within the study communities by means of two methodologies.

The first methodology, described in Appendix A-3i), is the simpler of the two, and is based upon the BIEUS data, coupled with some broad assumptions with regard to fuel consumption. Table 4 indicates that a major part (68%) of the building stock in the communities has a residential use. The remaining buildings have either a commercial (16%), or a community (16%) use. Bottom-line forecasted quantities, for each horizon year, and for each use sector, based upon current levels of fuel oil consumption, are shown graphically in Illustration 4. Because residential uses make up such a significant portion of the building stock, this approach concludes that residential use quantities would remain dominant throughout the study time span, with current heating policies unchanged.

The second methodology, described in Appendix A-3ii), takes a more articulated look at energy projections, by combining data from the 1980 Science Advisory Board (SAB) study, and the BIEUS data of 1982 to 1984. Basing projection calculations on the quantity relationships established in the SAB report, the Commercial sector would appear to be the dominant use sector. It would follow that the Commercial use sector should be the prime target for future programs of space heating energy conservation and/or conversion to biomass fuels.

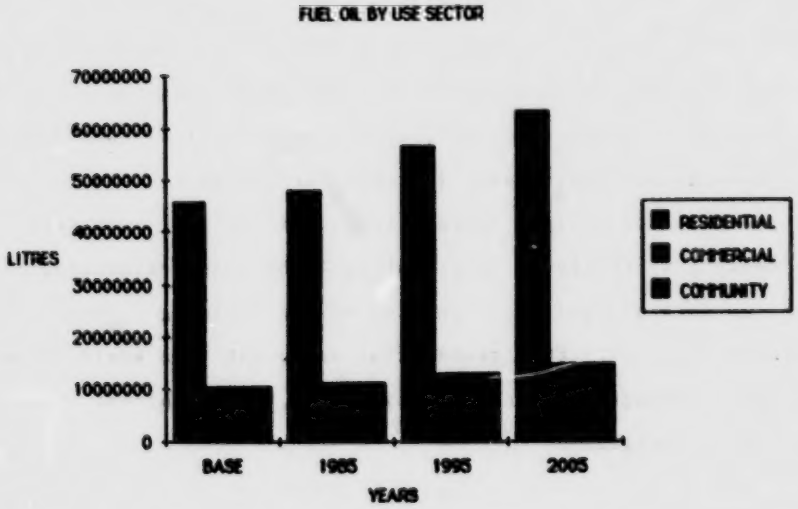


ILLUSTRATION 4

The reader should be aware, however, that use sector definition differences between the SAB and BIEUS reports, in the second methodology, cause an overstated commercial use of fuel, at the expense of the 'community use' sector of the BIEUS study. For instance, schools are known to be large fuel users; but these buildings were classified as 'commercial' in the SAB study, and as 'community' in the BIEUS efforts.

Chapter 5 - Activity 3 - Heating for Three Scenarios

Tables 6, 7, and 8 show projections for future fuel demand for oil, wood, and propane respectively. Each of the projections is based upon current estimated levels of demand. It is taken for granted in all projections that all fuels will grow in the same proportion as oil.

If, however, wood were to be burned on a large scale, it is felt that the demand for oil and propane would decline more in the smaller communities where wood supplies would be plentiful and close at hand.

1 cord of wood is normally considered to be the equivalent of 100 gallons or 455 litres of fuel oil.

In the larger centres of Yellowknife, Hay River, and Pine Point, it is probable that any switching away from fossil fuels would be slower and less pronounced than in the smaller communities. A great proportion of high-income office worker residents, unfamiliar with solid fuel appliances, may well opt to retain the greater reliability and security of fossil fuel systems, in spite of the higher cost to their household budgets.

Chapter 6 - Activity 4 - Biomass Energy Equivalent

In terms of ownership, the sheer number of units owned and operated by government agencies (NWT Housing Corporation, Territorial Government, Federal Government) cause them to be a major responsibility center for the current and future space heating consumption pattern, whether the fuel be oil or wood.

Tables 10,11,12, and 13 show estimated community wood use totals broken down by building use sector. Residential building use is most significant in this treatment.

The above suggests that Government-owned, Residential use buildings are also a potentially productive area for initial programs of space heating energy conservation and/or conversion to biomass fuels. Community-level quantity-specific investigations could produce more precise directions for action.

Chapter 7 - Activity 5 - Levels of Conversion to Biomass

Table 14 estimates the cordages that would be required to convert all currently-used fuel forms to biomass (wood fuel) in the study communities.

Conversion cordages for all communities would be as follows:

At Full Conversion - 186,462 cords
At Partial Conversion 93,231 cords
At Current Levels - - 30,434 cords

In real terms, conversion to biomass would gradually take place over a number of years, as people and communities reintroduced themselves to wood heat; and as entrepreneur harvesters and suppliers were able to provide sufficient quantities of suitable fuel at reasonable prices.

Professional foresters would wish to assure themselves and the population that the projected long-term harvesting could be sustained for future generations, and that the actual harvesting and regeneration techniques were as efficient as possible, while not interfering with other renewable-resource activities (trapping of fur-bearing animals).

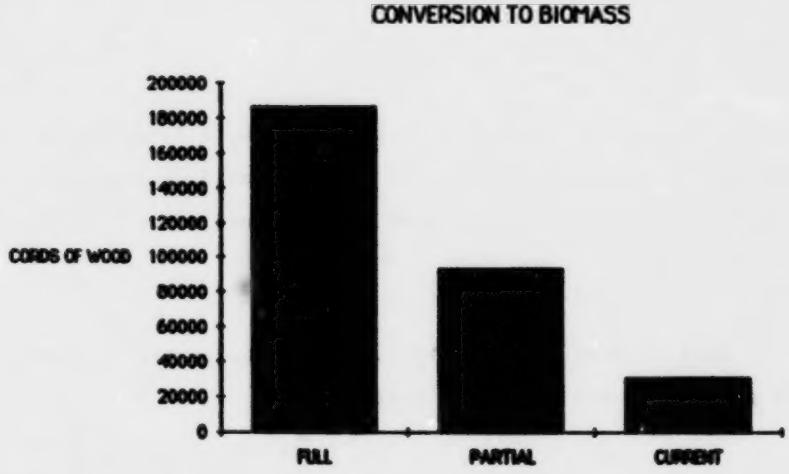


ILLUSTRATION 5

Chapter 8 - Activity 6 - Socio-Economic Impacts of Conversion

1. Value of Fossil Fuel Displaced

Table 15 of this study suggests that substantial savings can be made by the communities and agencies through the increased substitution of renewable biomass (wood) fuels for current levels of fossil fuel used.

It is concluded that full substitution of fossil fuels by wood could yield maximum annual savings in the order of $17.5 Million. Government leaders and their electorate should seriously consider the kinds of beneficial social programs (ex: alcohol education, health facilities, improved housing, etc.) that could flow from consistent savings of this order.

In supplement to these significant savings in a move to wood, there would probably be outstanding employment and entrepreneurial opportunities arising from the creation of community-based biomass culture , harvesting and associated services.

2.Conversion Costs

Table 16 contains gross estimates, by community, of the cost of converting the building stock to wood from fossil fuels.

While the costs of converting are substantial at $11.5 Million, annual savings of over $17 Million would indicate a rapid payback of about 1.5 years under total conversion. In real terms, conversion on a regional basis, would probably take place over a number of years.

3. Infrastructure Costs

Installation skills would be needed in the communities in order to effect a large-scale changeover. It would be necessary to train local people to do this, preferably at a local Educational Institute like Thebacha College.

Retail shops play an important educational role for the consumer, as well as being a convenient accessible supply point for wood burning appliances and perhaps wood fuel itself. While there are currently specialty wood-burning shops handling appliances and accessories in Yellowknife and Hay River, it may be useful for Government to consider providing financial and other incentive support to specialty stores for the largest communities in the Mackenzie. For instance, Fort Simpson and Norman Wells might do well with such outlets to serve their local populations and outlying communities.

Secure in-community storage yards would be a necessary feature of encouraging the development of a long term wood fuel marketing effort. Government could assist fuel dealers in the communities by facilitating the proper land acquisition, whether

owned or leased, perhaps within industrially-zoned land.

Improved quick-response fire protection service would minimize the potential damage caused by poorly operated or maintained wood burning equipment. Communities would probably seek more sensitive alarm systems, advanced fire fighting equipment, and specialized training for their fire departments. The safety arm of the Territorial Government would undoubtedly seek more manpower to properly support such undertakings.

In the context of increasing wood fuel use, community fire services would be required to give much closer attention to the inspections and public education aspects of their prevention role. This may also require increased manpower budgets for small communities employing their first professional fire-fighters to supplement current all-volunteer forces.

Municipal building inspections of appliance installation would require that proper training was available to community representatives charged with this activity; and possibly some additional staffing. As the principle supporter of communities, the Department of Local Government could expect to be the logical source of funding for program support.

4. Harvesting methods and options

Thus far, harvesting has been on a small scale (individual

with a chain saw and truck), whether on a private or business footing. The recent Manecon study confirms this approach is the preferred one for Rae-Edzo.

As the wood fuel market expands, other more mechanized harvesting techniques may become feasible; although care would have to be exercised so as not to harm employment potential, while maintaining overall enterprise profitability.

Access remains a problem in harvesting large volumes of wood, although the use of winter harvesting and hauling could lessen the requirement for all-weather roads. This suggested approach would be complemented by summer splitting and air-drying in the communities.

Table 17 suggests the preliminary areas required for silvaculture by community; a theoretical maximum distance from each BIEUS community center that a forest harvesting zone could extend over. Local topography and physical barriers (major rivers and mountain ridges) would stongly influence the location of access roads in relation to the home community.

5. Storage Requirements

Northerners currently seem to prefer to burn "fire-killed" wood because it can be harvested and burned without having to provide storage and management while air-drying.

A more beneficial, long-term approach would involve cutting green wood, and air-drying it after splitting (to accelerate seasoning) for a minimum of one year. There is some opinion that the tight grain of Northern woods may require more than one year to dry sufficiently. Proper air-drying will permit any green wood to be used as fuel; allowing communities to take wood from their immediate vicinity rather than hauling it from distant "burned" sites.

Secure in-community storage yards would be necessary to facilitate seasoned wood purchase by those users of wood burning appliances not having the ability or inclination to harvest and/or prepare their own biomass fuel.

6.Appliance Efficiency Impact

Without doubt, the efficiency of wood heating appliances will define the economic relationships that settle out of an increased use of wood. Currently on the market, there are a variety of appliances with varying efficiencies and prices. The Northern consumer will have to make some complex decisions in determining which of the purchase options represents the best value for his particular circumstances.

Consideration of the favourable cost per unit price advantage of wood over oil, as well as the local employment possibilties, should be spurring decision-makers to adopt

supportive programs associated with the large-scale use of wood fuel. The order of benefits can be clearly seen with the data already in existence. See Illustration 6 of this report for a visual representation of comparitive costs for equal physical energy value.

7.Environmental Impact

It is difficult to clearly predict with accuracy what environmental impacts will result from the shift to Biomass fuel.

The Yukon experience in the Riverdale suburb of Whitehorse (Appendix D), would indicate that local air quality can become a dangerous nuisance in particular circumstances. See the section of this chapter on air quality.

While forest regeneration around communities is not believed to be a problem, it may be wise to examine the possibilities in greater detail. Communities would wish to be assured that silvaculture practices would not adversely impact upon the more traditional pursuits of hunting and fishing. This is because the surrounding land surface of a community would be, at the same time, a renewable biomass material source area, as well as a habitat for the wild animal population. See the next section of this chapter on forest management planning.

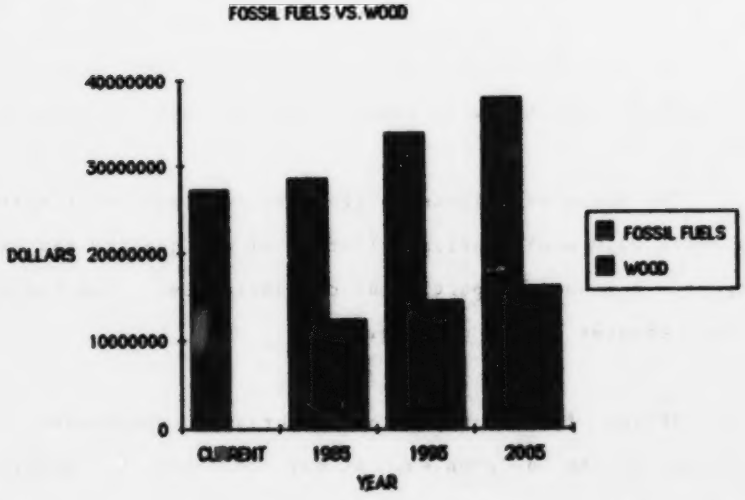


ILLUSTRATION 6

8.Forest Management Planning

To the present time in the Territories, the concentration of professional foresters has been on lumber-quality timber (forest stands with minimum six-inch butt trees).

The possibility of using wood resources for fuel opens up new dimensions for the management of renewable resources of the forests. See "Harvesting Methods and Options" in this chapter, and Table 17.

Forestry management plans for each community would be mandatory with the policy decision to proceed with the increased use of wood. The accompanying conceptual diagram (Illustration 7) of cutting zones suggest how broad areas around a community could be defined. Zonal location would be heavily influenced by local topography and access considerations.

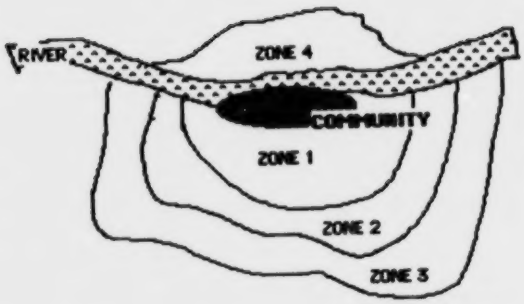


ILLUSTRATION 7: CONCEPTUAL CUTTING ZONES

9. Interior/Exterior Air Quality

Air quality is a special concern wherever there are the very young or old, or other individuals with marginal respiratory systems . Airborne particulate matter resulting from incompletely burned wood in a stagnant air mass over a settlement can cause serious problems. This would normally occur in a condition of thermal inversion where near-to-ground temperature is lower than in the air mass above. For those communities in a topographical depression, susceptible to stagnant air bodies sheltered from prevailing winds, care should be exercised. Most of N.W.T. communities, however, should not expect these kinds of conditions to develop with normal prevailing winds. Proper catalytic burners and firing practices help to minimize the amount of dangerous particulate matter and gases released to the local atmosphere.

Appendix D to this report contains a two page notice sent to all respondants of a recent television announcement by the Government of the Yukon. It is felt that the Whitehorse Riverdale subdivision, with its unique circumstances, is not a typical example of wood burning in space heating applications.

R.McCandless (See bibliography), in a more detailed examination, states that the economics of using wood over alternative heating sources are quite attractive, but concludes that more research on the issue of air pollution is needed to conclusively establish the relationship between health and wood smoke. McCandless is interested in comparing the Whitehorse

Riverdale situation with two other communities; Medford, Oregon and Juneau, Alaska.

Appendix E from Environment Canada concludes:

> "By weatherizing homes, using efficient wood burning appliances and proper combustion techniques, homeowners can reduce their fuel bills, enjoy the comfort of wood heat and preserve a healthy and pollution free environment."

10. Lifestyle

A movement from fossil fuels to wood biomass fuels would potentially create a new independence from Government. It would also bring a corresponding responsibility to user-residents and families to attend to the maintenance and good practice aspects of wood burning in order to keep their systems safely in operation.

This new independence could potentially provide considerable self-sufficiency on a number of levels:

-an increased measure of control over an important element of Northern living.

-another potential source of income for those who could be employed in a fuel wood industry.

-acquisition of a new satisfaction, dignity and pride with fuel "independence"; an increased sense of purpose and "control" for those communities and individuals involved.

The split between fossil and wood fuels used in any structure would be influenced by the work load, skills, health and age of the occupants. Smaller communities, with populations engaged in traditional pursuits, would be in the best position to harvest and utilize wood fuel.

Families that live and work in larger communities, in service employment, may well find that it is not as cost-effective for them to utilize wood. Some may, however, decide to substitute some wood for fossil fuel to make savings they could then spend on other interests (trip to Edmonton to see a hockey game, buy a new stereo, etc.). Some office workers may see the physical exercise of harvesting and preparing their own wood supply as an extra inducement to using additional amounts of wood in their fuel mix.

11. Alternate Uses of Biomass

The Reid Collins Alaska Report on p.49 states:

> "In some European countries it is not uncommon for heating to be provided to a city from a central source. So instead of a large number of small furnaces, there is a small number of large furnaces. Large industrial furnaces tend to be more efficient than small domestic furnaces".

Similarly, wood-fired district heating could offer some attractive possibilities in the N.W.T., especially in those parts of the communities where there is sufficient development density to justify the high cost of district heating schemes.

Generally-speaking, N.W.T. community residential land use densities tend to be much lower than needed to justify a district heating scheme. There are some commercial sections of our communities, however, where district heating could potentially be viable (ex: City of Yellowknife core area).

The extensive development pattern of Northern Settlements preclude them from district heating innovation because such schemes cannot be justified economically. If techniques could be found to promote denser residential and commercial developments, there would be hope of creating some efficient wood-fired heating schemes in future years. It is more likely that the initial inroads for district heating will come about in a commercial development context.

All of the above will be unlikely to occur until some semblance of user-pay policy comes into effect because innovators and consumers tend not to take action until their efforts are rewarded with profits.

Technologically-sophisticated manufacturers have developed various methods of obtaining greater heat recovery efficiencies by wood chip burning, or through micro-chip controlled burning for greater combustion of as given amount of fuel. As in all things, the potential consumer must carefully consider whether a given innovation is worth the price demanded in terms of its overall benefits and costs.

There also remain alternative biomass uses in the co-generation of electicity and heat in central district facilities, or the generation of electricity with wood gas.

12. Employment Generation

For many NWT communities, this is one of the most interesting and potentially beneficial aspects of a fuel switch to biomass from fuel oil. The net socio-economic benefits of the increased use of wood fuel could be considerable. Beyond the initial savings over oil expenditures (where the bulk of cash returns quickly to the Mainstream Southern Economy), monies expended for wood fuel could stimulate small local entrepreneurs and their employees; and encourage the circulation of cash within the Northern communities.

The Manecon study (See bibliography) estimated that with conversion of Rae to wood fuel, there would be in the order of 62,000 man-hours of work generated in the 1984-1988 period. This would translate to 39 man-years of employment, or an average of 10 man-years per year for the four year conversion period.

Most communities, then, by moving to wood energy, could expect there would be a handful of jobs created for local people interested in providing heating wood fuel, maintenance, or associated services. These jobs would be a permanent feature of life in the settlements.

Table 18 presents estimates of the number of man-days of employment, by community, that could be potentially generated in harvesting, handling, and associated maintenance. It is expected that the total local employment brought about by a Partial Conversion to Biomass would be in the order of 109,000 man-days per year, which in turn translates to 545 man-years of full-time employment. On a part-time basis, which may better suit lifestyle in the smaller communities, there could be considerably more positions available. Each community could adopt its own approach to these employment and exploitation opportunities.

It is conceivable that larger communities such as Yellowknife, Hay River, and Pine Point may draw wood supplies from entrepreneurs in smaller communities accessible by road.

13. Building Fire Safety/Education

This is perhaps the most worrisome, negative aspect of a switchover to wood fuel, because safe wood heat demands a certain user attention to details of creosote buildup, chimney-cleaning and ash clean-out. It is almost inevitable that there would be some fatalities attributable to errors in maintenance or operation of wood-burning appliances.

Minimization of accidents with fire would require an educational campaign to point out the life-threatening consequences of improper operation; one which would also promote the principles behind safe use of a wood-burning appliance in the home. Such a campaign would have to enjoy a high public profile in all media forms; and probably be coupled with a school-presented wood safety information program.

Chapter 9 - Activity 7 - Review of Two Referenced Reports

i) Review of Manecon/Rae Report

This report assessed the technical and economic feasibility for the complete conversion of heating systems in Rae-Edzo, NWT, away from fuel oil to wood.

Present and projected fuel consumption quantities were identified. The capital and operating costs for the installation of appropriate wood burning equipment were assembled for the J.Bruneau School, the Cottage Hospital, Nishi Khon Centre commercial complex, and a number of other commercial, municipal, and residential buildings. Centralized or district heating systems using wood fuel were considered for residential areas and for a core of major buildings.

Certain operational buildings were judged economically viable for conversion to wood fuel, while others were considered more marginal.

The report concludes that the community possesses the skills and infrastructure to sustain the predominant use of wood fuel, while injecting over $1.5 Million into the local economy, including 62,000 man hours of employment.

COMMENT: A good report which might have been improved by the presentation of an implementation program plan description and activity schedule allowing decision makers at all levels to translate the 'movement to wood fuel' into discrete and more understandable steps.

ii) Review of Reid, Collins Alaska/ Remote Village Report

This report assessed Alaska's Interior forest resources and identified areas with plentiful wood supplies in order to select a well-wooded "best case" remote community. HUSLIA was chosen for socio-economic reasons, and because there is extensive forest on its lands. The people in this well-organized community seek opportunities to earn cash without sacrificing their subsistence lifestyle.

Electrical power generation and wood gasification are a major focus of this report. The consultant recommends that operating wood gasifiers in Tahiti and Germany be visited, as a prelude to selecting the best gasifier design for Interior Alaska.

The report concludes that in the shorter term, the use of fuelwood for space heating would be more economically attractive than the production of wood gas for electricity generation.

COMMENT: This technically-oriented report realistically recognizes the more psychologial aspect of the villagers' need for self-sufficiency.

Chapter 10 - Conclusions

Although a historical form of heating, the technology surrounding wood heat has changed remarkably in the last fifty years. Tighter (improved air seal) and better insulated buildings, coupled with more efficient burning appliances; have reduced the amounts of energy required to heat a given building in a specific location.

The preference of Private owner/operators for wood heat is caused by their direct accountability for costs incurred, in spite of the additional effort required to maintain wood-fired heating systems. Sadly, it seems that Government owner/operators have little motivation to find similar low-cost fueling options, because user-pay programs or heating performance monitoring are not in effect. Commercial operations have the luxury of charging high energy costs off against their revenues.

With improved cost-effective conservation, it is both reasonable and possible for the treed Mackenzie area to simultaneously reduce space heating fuel requirements by about 20%, while absorbing the forecasted rise in population beyond the turn of the century.

Given the great utilization of fuel for commercial uses referenced in the Science Advisory Report of 1980, it is logical

to consider this as the prime target area for any future programs of energy conservation and /or conversion to biomass fuels.

In the larger communities of Yellowknife, Hay River, and Pine Point , it is probable that any switch away from fossil fuels would be slower and less pronounced than a similar move in the smaller communities. Populations in the larger communities are less familiar with solid fuel. In contrast, the smaller communities would have an employment incentive to convert as quickly as possible ; and have populations adept at harvesting and handling wood fuel.

In real terms, conversion to biomass should take place over a number of years, as people and communities re-introduce themselves to wood heat; and as entrepreneur harvesters and suppliers are able to provide sufficient quantities of suitable fuel.

As well as significant savings of up to $17.5 Million per year in fuel, much of which could be diverted into social support budget items by Government; around 1000 steady jobs could be created within the study communities, at full implementation.

From an investment point of view, the conversion from fossil fuels to wood would result in a rapid payback of a few years.

Infrastructure costs involved in making a deliberate shift towards biomass fuels would require major program committments on the part of Government across a spectrum of items in education, safety and business support.

Forestry inventory and management plans, in conjunction with community land use plans, would have to be created to manage harvesting and storage requirements of a major shift to biomass.

A smooth implementation of increased biomass use would require some detailed investigation of both appliance efficiency and air quality.

Life-style differences would be considerable, with both more control and responsibility for communities over their own fuel management, and reduced rates of unemployment.

Depending upon the level of conversion to wood fuels from fossil fuels, the communities could look forward to between 500 and 1000 full-time jobs.

Chapter 11 - General Recommendations

-that user-pay for space heating energy be phased-in for all buildings of all ownership groups in communities South of the treeline.

-that Government, as a major player in building operations, institute space heating user-pay and performance analysis with the shortest possible delay.

-that all space heat consumers, especially those in the smaller well-wooded communities, should consider moving to wood heat; initially as a supplement to fossil fuels, and then as the principal energy form. The commercial building use sector could quickly benefit from a fuel change.

-that Government departments, (initially Social Housing, and later staff housing, and then all government buildings) begin to provide wood fuel on the same basis as they currently provide fuel oil.

-that more detailed research be done on the quantities and types of fuel used, by building unit, for a representative community. The purpose of this research would be to prepare an example of community-based planning analysis, oriented to the reduction of fossil fuel consumption.

-that the City of Yellowknife, as a major energy consumer in the Mackenzie Valley, conduct a BIEUS-like survey, compiling a unit-by-unit fuel quantities and building description database to assist in rationalizing the energy use of the Capital city .

Bibliography

Canada Mortgage and Housing Corporation; Heating with Wood.....Safely; 1981.

Canadian Home Builders' Association; R2000 Builders' Manual; January 1985.

Devine, Marina (Ed.); NWT Data Book 1984/85; Outcrop Ltd., Yellowknife, N.W.T.; 1984.

Energy, Mines and Resources Canada; Building Inventory and Energy Use Survey (Upper Mackenzie Communities); 1982.

Energy, Mines and Resources Canada; The Billpayer's Guide to Heating Systems; April 1983.

Energy, Mines and Resources Canada; Heating with Wood....A Homeowner's Guide; 1982.

Hackleman, Michael; At Home with Alternative Energy; Peace Press, Culver City, California 90230; 1980.

McCandless, R.; Impact of Residential Wood Combustion on Measured Particulate and PAH Concentrations in Whitehorse, YT; Paper prepared for the 77th Annual Meeting of the Air Pollution

Control Association, San Francisco, California; June 1984

Manecon Partnership; Rae-Edzo Community Wood Heating Conversion Study; Report prepared for the Incorporated Hamlet of Rae-Edzo, N.W.T.; Edmonton; May 1984.

Manitoba Department of Labour and Manpower; The Safe Use of Solid Fuel Appliances; 1982.

Memorial University; Wood Heating Proceedings of the Atlantic Conference on Wood Heating; St.John's, Nfld.; February 1979.

Nova Scotia Dept. of Mines and Energy; The Wood Book, The Homeowner's Wood Burning Manual; Halifax; 1979.

Overvold, Joanne (Ed.); Our Metis Heritage....a Portrayal; The Metis Association of the Northwest Territories; Yellowknife, 1976.

Reid, Collins Alaska Inc.; Use of Wood Energy in Remote Interior Alaskan Communities; Division of Energy and Power Development; Anchorage, Alaska, U.S.A.; September 1981.

Science Advisory Board, G.N.W.T.; Energy in the Northwest Territories, A Summary of Electricity and Petroleum Consumption; 1980.

Shelton, Jay; Woodburners Encyclopedia; Vermont Crossroads Press; Waitsfield, Vermont, U.S.A.; 1976.

Shelton, Jay W.; Wood Heat Safety; Garden Way Publishing; Charlotte, Vermont 05445, U.S.A.; 1979.

Statistics Canada and G.N.W.T. Bureau of Statistics; 1981 Census Population by Ethnic Origin, Age, and Sex; 1983.

Treeline Planning Services Ltd.; Building Inventory and Energy Use Survey 1983 (Lower Mackenzie Communities); Energy, Mines and Resources Canada; Yellowknife, N.W.T.; 1983.

Treeline Planning Services Ltd.; Building Inventory and Energy Use Survey 1984 (Mackenzie Valley Communities); Energy, Mines and Resources Canada; Yellowknife, N.W.T.; 1984.

APPENDIX A - NOTES ON TABLE DEVELOPMENT

Appendix A-1
Notes on the Development of Table 1

These estimates were derived largely from research with the January 1985 edition of the assessment roles of the City of Yellowknife, supplemented with additional information from some of the major ownership groups and fuel dealers, as well as some calculations based on a limited sample. It is estimated that there are 3354 building units in Yellowknife.

In order to build confidence that the total unit numbers in Table 1 reflect actual conditions, a second count of the assessment role broken out by code and supplemented by multi-premise utility billings information, was done. It suggested only a few more units than the first count.

Appendix A-2

Notes on Development of Tables 2 & 3

In its simplest terms, the "Without Conservation" scenario is basically current per capita consumption figures, multiplied by the forecasted future populations.

The "Maximum Conservation" scenario is calculated to be 40% of the "Without Conservation" figures; this is rationalized on the basis that an R2000-like performance standard in all buildings (New and Rehabilitated) would save around 60% of the current energy budget. The cost of a "Maximum Conservation" program would be truly enormous, and would be beyond the reach of even the most extravagant spending authority. The scenario is only calculated in this study for purposes of comparison.

The "Cost-effective" scenario figures shown in Table 2 have been developed in separately in the background Table 3. For purposes of calculation, it is presumed that R2000 standards would be utilized for all 'new' construction, and that all cost-effectively 'rehabilitated' buildings would consume about 80% of their current energy usage. It is considered that a 20% energy saving over existing fuel consumption on a current building, is achievable with a modest dollar outlay (usually tightening the air seal of the building and increasing attic insulation) for rehabilitation.

In the "Cost-effective" scenario, it is interesting to note that, in spite of rising population, older building unit write-offs, and an increasing number of R2000-standard buildings in the community stock, there is a substantial overall space-heating energy demand decline over the study forecast period. More interestingly, however, is the realization that "Cost-effective" Conservation measures could maintain demand at around the 50 million litre mark over the entire forecast period beyond 2000 A.D.

Appendix A-3i)

Notes on Development of Tables 4 & 5

In the absence of fuel quantity data per building, it was initially possible to calculate gross theoretical projected quantities by supposing that all buildings of a given use would consume an equal amount of fuel.

Table 4 breaks out fuel use by ownership and use sector, for the current and projected horizon years, according to the percentage of the total study quantities made up by any given ownership/use sector combination.

Table 5 is background to Table 4, showing the 'by community, by building sector use, by ownership', consistent with the definitions used in the BIEUS studies. The data was principally extracted from the BIEUS database, and supplemented for those communities not in the database. Detailed Yellowknife ownership/user data was sourced from Table 1 of this study.

The reader should be aware that there is a skewing effect in the current model because the large Yellowknife sample (making up about 40% of the totals) on the more precise and accurate data of the smaller BIEUS communities. It may very well be that a more detailed examination of the Yellowknife situation could yield some useful recommendations for the City's energy users.

Appendix A-3ii)

Notes on Development of Tables 4A to 4E; and 4-1 to 4-28

A second (more detailed) and community-oriented method of projecting future fuel consumption figures was developed, whereby previously produced Science Advisory Board (SAB) figures were used to break-out use sector proportions of fuel, and applied to the future "Without Conservation" projections of Table 2.

An examination of the documented SAB fuel use by sector (See Table 4A), revealed that Commercial quantities dominate the fuel consumption picture in most communities followed by residential and an "unidentified" category.

By applying the community specific use sector percentages calculated in Table 4A against the community projected figures (Without Conservation) from Table 2, it was possible to produce, a by community, by use sector figure for each horizon years in succeeding Tables 4B(current), 4C(1985), 4D(1995), and 4E(2005).

By further combining data from Table 5 on the ownership assignment of building units, by use sector (BIEUS source); and data from Tables 4B through 4D on the amount of fuel consumed by each sector, by community; and assuming that each building within a given community and use sector consumed an equal amount of fuel; it was possible to calculate an estimated amount of fuel by ownership party. Each study community is represented in a table

in the series of Tables 4-1 to 4-28.

The higher percentages of commercial fuel use in the larger communities (Hay River, Fort Simpson and Fort Providence), or in the more industrial communities (Norman Wells and Pine Point) is a reflection of the 1980 SAB use patterns. Yellowknife commercial quantities, while substantial, are a smaller percentage of the total community fuel picture than the SAB average might suggest.

Science Advisory Board (SAB) and BIEUS definition differences with regard to use sectors create problems in combining the two data sets. The SAB report suggests dominant "commercial" use patterns, but includes within this category, fuel consumers that were classified as "community" users in the BIEUS reports.

Classification variances in the SAB and BIEUS approaches are also obvious in those community projections (Tables 4-1 to 4-28), where the SAB identifies a commercial use, and BIEUS studies reported no such building use. This occurs a number of times in smaller communities, where there are periodically no buildings reported within a certain use sector. For the bigger communities, these inconsistencies are hidden in the larger numbers.

Appendix A-4

Notes on the Development of Tables 9,10,11,12,& 13

In Table 9, current energy quantities are converted into a total energy demand expressed in Gigajoules. These figures are then broken out into cord estimates per ownership group, proportional to the ownership of building units in the community, and then summed by community.

Tables 10,11,12, and 13 show the estimated biomass (fuel wood) cordage required to convert each community totally to biomass, as well as the ownership breakdown amounts within that total.

Appendix A-5

Notes on the Development of Table 15 & 16

Table 15 shows estimates of the value of fuel oil and propane currently used, by community, translates the physical energy of both fossil fuels into a Gigajoule equivalent; and then re-converts this energy measure into a biomass (wood) substitute, with a calculated value. Finally, an attempt to compute values by community is made to show the market potential that would exist under the substitution of current fossil fuels. With the full substitution scenario, the estimated savings of using wood instead of oil are estimated to be in the order of $17.5 Million.

In Table 16, gross estimates are made by community, of the likely cost of supplementing heating plants with wood burning appliances. In realistic terms, it is probably more likely that air-tight stoves would be installed initially before full-scale wood burning or mixed fuel devices were installed in light duty buildings. The Manecon study for Rae indicates somewhat higher costs than those indicated here. Assumptions for the current calculations are based upon interview with Yellowknife's retailer/installer, and existing studies which touch upon cost elements of conversion. It is assumed that existing heating appliances will remain in place as stand-by to new wood burning equipment.

Appendix A-6

Notes on the Development of Table 17

This table was developed in connection with the BIEUS'82 and '83 communities, (excludes Yellowknife and Snare Lakes). Each community's buildings are assigned an average fuel consumption of 10 cords of wood per year. By inserting forest yield figures in cords per acre, it is possible to calculate the acres of forest required.

Consideration of the longer term perspective required a life-cycle (life-cycle defined as 125 years) area in acres and square miles. Finally a radius figure is calculated to give some idea of how far a community would have to go in order to gather their biomass energy supply.

The figures, at this stage, are theoretical, but with closer definition by professional foresters; they could help give confidence to communities and decision-makers that a switch to biomass fuels is feasible.

Appendix A-7

Notes on the Development of Table 18

This table was prepared to get some notion of the amount of employment that could be created by a move to biomass fuels.

Basically, the table takes the current fuel consumptions and converts them into a total energy figure, which is, in turn, converted, for three different conversion levels, into number of cords, biomass harvest jobs in man-days, and total jobs in man-days. 'Biomass Harvest' jobs refer only to the cutting and stacking of the raw material in the field. The' Total Jobs' (estimated by assuming every harvest job will generate 2.5 others) refer to these 'Biomass Harvest' jobs plus the spin-off jobs that would have to be done; such as wood splitting, wood stacking, wood retailing, stove retailing and installation, chimney sweeping.

APPENDIX B - ALL TABLES

TABLE 1 - YELLOWKNIFE BUILDINGS AND OWNERSHIP (ESTIMATED)

FUEL TYPE	OIL	WOOD	PROPANE	OIL & WOOD	TOTAL
BUILDING OWNERSHIP					
YK HOUSING AUTHORITY	179	0	0	0	179
TERRITORIAL GOV'T	312	0	92	0	404
FEDERAL GOV'T	582	0	4	0	586
CROWN CORPORATIONS	18	0	0	0	18
MUNICIPAL	30	0	8	0	38
SUB-TOTAL GOV'T	1121	0	104	0	1225
PERCENTAGE GOV'T	56.30	.00	19.48	.00	36.52
INDUSTRIAL	94	0	5	0	99
COMMERCIAL	252	0	145	0	397
SUB-TOTAL BUSINESS	346	0	150	0	496
PERCENTAGE BUSINESS	17.38	.00	28.09	.00	14.79
COMMUNITY	48	0	0	0	48
COMMUNITY PERCENTAGE	2.41	.00	.00	.00	1.43
PRIVATE	476	22	280	807	1585
PERCENTAGE PRIVATE	23.91	100.00	52.43	100.00	47.26
TOTAL	1991	22	534	807	3354
% OF ALL UNITS	59.36	.66	15.92	24.06	100.00

SOURCES: 1.CITY OF YELLOWKNIFE ASSESSMENT LISTS
2.INTERVIEW SELECTED FUEL DEALERS
3.INTERVIEW SELECTED FUEL USERS
4.SAMPLING OF FUEL TYPES ON PRIVATE-OWNED BUILDING UNITS

TABLE 2 - HEATING DEMAND

COMMUNITY	VOLUME OF FUEL OIL IN LITRES	1983e POPULAT'N	CONSUMPT. l./person	1985p POPULAT'N	SCENARIO W/CONS PROPORT'L	SCENARIO C-E/CONS	SCENARIO MAX/CONS PROPORT'L*.4
ARCTIC RED RIVER	149,559	118	1267.45	124	157,164	124,324	62,865
COLVILLE LAKE	4,909	59	83.20	59	4,909	3,731	1,964
DETAH	232,287	146	1591.01	152	241,833	178,456	96,733
ENTERPRISE	79,550	46	1729.35	48	83,009	61,791	33,203
FORT FRANKLIN	1,163,120	563	2065.93	594	1,227,164	894,323	490,866
FORT GOOD HOPE	1,008,955	528	1910.90	550	1,050,995	776,194	420,398
FORT LIARD	730,157	411	1776.54	429	762,135	561,226	304,854
FORT MCPHERSON	1,290,954	658	1961.94	693	1,359,622	996,869	543,849
FORT NORMAN	1,392,724	287	4852.70	296	1,436,398	1,063,864	574,559
FORT PROVIDENCE	700,000	645	1085.27	680	737,984	541,550	295,194
FORT RESOLUTION	1,033,300	488	2117.42	509	1,077,766	792,537	431,106
FORT SIMPSON	1,227,444	1,040	1180.23	1,095	1,292,357	952,177	516,943
FORT SMITH	5,000,000	2,383	2098.20	2,490	5,224,507	3,841,248	2,089,803
HAY RIVER	8,907,922	3,136	2840.54	3,282	9,322,640	6,828,121	3,729,056
HAY RIVER VILLAGE	30,000	298	100.67	298	30,000	22,800	12,000
JEAN-MARIE RIVER	86,626	72	1203.14	76	91,439	67,465	36,575
KAKISA	100	34	2.94	34	100	76	40
LAC LA MARTRE	507,078	294	1724.76	304	524,326	387,647	209,730
NAHANNI BUTTE	147,625	90	1640.28	94	154,186	114,210	61,674
NORMAN WELLS	100	543	.18	567	104	18,403	42
PINE POINT	3,223,100	1,570	2052.93	1,638	3,362,699	2,478,315	1,345,080
RAE LAKES	215,775	205	1052.56	211	222,090	165,745	88,836
RAE-EDZO	2,078,715	1,506	1380.29	1,577	2,176,716	1,586,818	870,686
SNARE LAKES	100	77	1.30	81	105	1,600	42
SNOWDRIFT	672,896	258	2608.12	270	704,193	514,812	281,677
TROUT LAKE	41,000	61	672.13	65	43,689	32,909	17,475
WRIGLEY	476,271	144	3307.44	149	492,808	364,790	197,123
YELLOWKNIFE	36,368,717	10,504	3462.37	10,981	38,020,267	27,821,865	15,208,107
TOTAL	66,768,984	26,164		27,346	69,801,204	51,193,866	27,920,482
AVERAGE			1634.63				
$VALUE	27,375,283				28,618,494	20,989,485	11,447,397

FUEL COST PER LITRE ASSUMED AT $.41

UNDER THREE SCENARIOS

1995p POPULAT'N	SCENARIO W/CONS PROPORT'L	SCENARIO C-E/CONS	SCENARIO MAX/CONS PROPORT'L*.40	2005p POPULAT'N	SCENARIO W/CONS PROPORT'L	SCENARIO C-E/CONS	SCENARIO MAX/CONS PROPORT'L*.
156	197,722	137,505	79,089	183	231,943	147,692	92,777
55	4,576	5,123	1,830	67	5,575	14,960	2,230
185	294,336	184,379	117,735	215	342,066	184,676	136,827
45	77,821	59,676	31,128	41	70,903	54,094	28,361
750	1,549,449	918,688	619,780	845	1,745,713	903,886	698,285
670	1,280,303	809,580	512,121	751	1,435,086	803,789	574,034
536	952,224	583,907	380,890	621	1,103,230	584,481	441,292
864	1,695,113	1,051,753	678,045	991	1,944,279	1,057,244	777,711
366	1,776,087	1,067,305	710,435	428	2,076,954	1,048,752	830,782
871	945,271	583,266	376,109	1,009	1,095,039	592,921	438,016
620	1,312,799	806,217	525,120	704	1,490,662	793,802	596,265
1,346	1,588,596	1,027,782	635,438	1,529	1,804,579	1,042,967	721,831
2,962	6,214,855	3,915,068	2,485,942	3,337	7,001,679	3,859,630	2,800,671
3,862	10,970,151	6,827,412	4,388,061	4,338	12,322,247	6,660,519	4,928,899
298	30,000	27,333	12,000	298	30,000	26,133	12,000
94	113,095	74,267	45,238	113	135,955	78,542	54,382
31	91	182	36	27	79	68	32
367	632,985	388,316	253,194	435	750,268	383,452	300,107
117	191,913	124,423	76,765	134	219,797	127,081	87,919
576	106	66,738	42	776	143	219,462	57
1,943	3,988,843	2,544,779	1,595,537	2,155	4,424,064	2,505,514	1,769,626
255	268,403	175,992	107,361	300	315,768	180,531	126,307
1,925	2,657,056	1,595,805	1,062,822	2,269	3,131,875	1,576,324	1,252,750
96	125	10,243	50	110	143	15,572	57
333	868,505	513,136	347,402	396	1,032,817	504,126	413,127
81	54,443	40,930	21,777	95	63,852	45,410	25,541
177	585,416	369,687	234,167	206	681,332	367,015	272,533
12,752	44,152,121	27,441,500	17,660,848	14,106	48,840,168	26,502,351	19,536,067
32,333	82,402,406	51,350,992	32,960,963	36,479	92,296,217	50,280,994	36,918,487
	33,784,987	21,053,907	13,513,995		37,841,449	20,615,208	15,136,580

TABLE 3 - HEATING DEMANDS FOR 'COST-EFFECTIVE SCENARIO'

COMMUNITY	1983e POP'N	DIEUS BUILDINGS	PERSONS PER BUILDING	HEATING FUEL USED	FUEL(1.) PER BUILDING	FORECAST 1985 POPUL'N	FORECAST 1985 BUILD'GS	FORECAST NEW BUILD'GS	*NOTE 1 REHAB EST. FUEL USED	*NOTE 4 NEW EST. FUEL USED	TOTAL EST. FUEL USED	FORECAST 1995 POPUL'N	FORECAST 1995 BUILD'GS	FORECAST NEW BUILD'GS	*NOTE 2 REHAB EST. FUEL USED	*NOTE 4 NEW EST. FUEL USED	TOTAL EST. FUEL USED	FORECAST 2005 POPUL'N	FORECAST 2005 BUILD'GS	FORECAST NEW BUILD'GS	*NOTE 3 REHAB EST. FUEL USED	*NOTE 4 NEW EST. FUEL USED	TOTAL EST. FUEL USED
ARCTIC RED RIVER	118	53	2.23	149,559	2,821.9	124	56	8	113,665	10660	124,324	156	70	22	107,682	29823	137,505	183	82	34	101,700	45992	147,692
COLVILLE LAKE	59	37	1.59	4,909	132.7	59	37	0	3,731	0	3,731	55	34	1	3,534	1589	5,123	67	42	9	3,338	11622	14,960
DETAH	146	35	4.17	232,287	6,636.8	152	36	1	176,538	1918	178,456	185	44	13	167,247	17132	184,379	215	52	20	157,955	26721	184,676
ENTERPRISE	46	23	2.00	79,550	3,458.7	48	24	1	60,458	1533	61,791	45	23	2	57,276	2400	59,676	41	21	0	51,094	0	54,094
FORT FRANKLIN	563	141	3.99	1,163,120	8,249.1	594	149	8	883,971	10351	894,323	750	188	61	837,446	81242	918,688	845	212	85	793,922	112964	903,886
FORT GOOD HOPE	528	169	3.12	1,008,955	5,970.1	550	176	7	766,806	9389	776,194	670	214	62	726,448	83132	809,580	751	240	88	666,089	117700	803,789
FORT LIARD	411	108	3.81	730,157	6,760.7	429	113	5	554,919	6306	561,226	536	141	44	525,713	58194	583,907	621	163	66	496,507	87974	584,481
FORT MCPHERSON	658	222	2.96	1,290,954	5,815.1	693	234	12	981,125	15744	996,869	864	292	92	929,487	122266	1,051,753	991	334	135	877,849	179395	1,057,244
FORT NORMAN	287	129	2.22	1,392,724	10,796.3	296	133	4	1,058,470	5394	1,063,864	366	165	48	1,002,761	64543	1,067,305	428	192	76	947,052	101699	1,048,752
FORT PROVIDENCE	645	132	4.89	700,000	5,303.0	680	139	7	532,000	9550	541,550	871	178	59	504,000	79266	583,266	1,009	206	88	476,000	116921	592,921
FORT RESOLUTION	488	126	3.87	1,033,300	8,200.8	509	131	5	785,308	7229	792,537	620	160	47	743,976	62241	806,217	704	182	68	702,644	91158	793,802
FORT SIMPSON	1040	274	3.80	1,227,444	4,479.7	1,095	288	14	932,857	19320	952,177	1,346	355	108	883,760	144022	1,027,782	1,529	403	156	834,662	208305	1,042,967
FORT SMITH	2383	689	3.46	5,000,000	7,256.9	2,490	720	31	3,800,000	41248	3,841,248	2,962	856	236	3,600,000	315068	3,915,068	3,337	965	345	3,400,000	459630	3,859,630
HAY RIVER	3136	936	3.35	8,907,922	9,517.0	3,282	980	44	6,770,021	58101	6,828,121	3,862	1,153	310	6,413,704	413708	6,827,412	4,338	1,295	452	6,057,387	603132	6,660,519
HAY RIVER VILLAGE	298	43	6.93	30,000	697.7	298	43	0	22,800	0	22,800	298	43	4	21,600	5733	27,333	298	43	4	20,400	5733	26,133
JEAN-MARIE RIVER	72	22	3.27	86,626	3,937.5	76	23	1	65,836	1630	67,465	94	29	9	62,371	11896	74,267	113	35	15	58,906	19637	78,542
KAKISA	34	7	4.86	100	14.3	34	7	0	76	0	76	31	6	0	72	110	182	27	6	0	68	0	68
LAC LA MARTRE	294	50	5.88	507,078	10,141.6	304	52	2	385,379	2268	387,647	367	62	17	365,096	23219	388,316	435	74	29	344,813	38638	383,452
LAC LA MARTRE	90	34	2.65	147,625	4,341.9	94	36	2	112,195	2015	114,210	117	44	14	106,290	18133	124,423	134	51	20	100,385	26696	127,081
NORMAN WELLS	543	311	1.75	100	.3	567	325	14	76	18327	18,403	576	330	50	72	66666	66,738	776	444	165	68	219394	219,462
PINE POINT	1570	498	3.15	3,223,100	6,472.1	1,638	520	22	2,449,556	28759	2,478,315	1,943	616	168	2,320,632	224147	2,544,779	2,155	684	235	2,191,708	313806	2,505,514
RAE LAKES	205	45	4.56	215,775	4,795.0	211	46	1	163,989	1756	165,745	255	56	15	155,358	20634	175,992	300	66	25	146,727	33804	180,531
RAE-EDZO	1506	208	7.24	2,070,715	9,955.4	1,577	218	10	1,573,743	13074	1,586,818	1,925	266	79	1,490,915	104891	1,595,805	2,269	313	126	1,408,086	168237	1,576,324
SNARE LAKES	77	22	3.50	100	4.5	81	23	1	76	1524	1,600	96	27	8	72	10171	10,243	110	31	12	68	15504	15,572
SNOWDRIFT	258	55	4.69	672,896	12,234.5	270	58	3	511,401	3411	514,812	333	71	21	484,485	28650	513,136	396	84	35	457,569	46557	504,126
TROUT LAKE	61	20	3.05	41,000	2,050.0	65	21	1	31,160	1749	32,909	81	27	9	29,520	11410	40,930	95	31	13	27,880	17530	45,410
WRIGLEY	144	61	2.36	476,271	7,807.7	149	63	2	361,966	2824	364,790	177	75	20	342,915	26772	369,687	206	87	32	323,864	43151	367,015
YELLOWKNIFE	10504	3000	3.50	36,368,717	12,122.9	10,981	3,136	136	27,640,225	181641	27,821,865	12,752	3,642	942	26,185,476	1256023	27,441,500	14,106	4,029	1,329	24,730,728	1771624	26,502,351
TOTAL	26164	7450		66,760,984		27,346	7,786	342	50,738,348	455049	51,193,867	32,333	9,167	2462	48,067,908	3283081	51,350,990	36,479	10,367	3,663	45,397,469	4883524	50,280,994
AVERAGE			3.67		5,713.4																		

NOTE 1 - Assumed 5% unit write-off and after rehabilitated fuel consumption at 80% of current
NOTE 2 - Assumed 10% unit write-off and after rehabilitation fuel consumption of 90% of current
NOTE 3 - Assumed 15% unit write-off and after rehabilitation fuel consumption of 80% of current
NOTE 4 - Assumed R2000 performance with estimated fuel consumption at 1,333.3 litres per heating season

TABLE 4 - HEATING DEMAND BY USE SECTOR AND OWNERSHIP

USE SECTOR & OWNERSHIP	*-0000	% OF TOTAL	** CURRENT EST. FUEL	PROJECTED 1985 FUEL	PROJECTED 1995 FUEL	PROJECTED 2005 FUEL
RESIDENTIAL						
MWTHC	544	7.02	4689172	4902124	5787104	6481944
TERR.	349	4.51	3008311	3144929	3712683	4158453
FED.	226	2.92	1948075	2036544	2404201	2692867
CROWN CORP	101	1.30	870600	910137	1074444	1203449
COMMUNITY	62	.80	534428	558698	659560	738751
INDUSTRIAL	430	5.55	3706515	3874841	4574365	5123596
COMMERCIAL	267	3.45	2301487	2406006	2840362	3181396
PRIVATE	1622	20.94	13981318	14616260	17254932	19326680
OTHER - @	1697	21.91	14627803	15292105	18052786	20220331
SUBTOTAL	5298	68.40	45667709	47741645	56360437	63127467
COMMERCIAL						
MWTHC	2	.03	17240	18023	21276	23831
TERR.	43	.56	370651	387484	457437	512360
FED.	21	.27	181016	189236	223399	250222
CROWN CORP	37	.48	318933	333417	393608	440868
COMMUNITY	7	.09	60339	63079	74466	83407
INDUSTRIAL	1	.01	8620	9011	10638	11915
COMMERCIAL	245	3.16	2111851	2207758	2606324	2919258
PRIVATE	31	.40	267214	279349	329780	369376
OTHER - @	840	10.84	7240633	7569457	8935970	10008885
SUBTOTAL	1227	15.84	10576497	11056813	13052899	14620121
COMMUNITY						
MWTHC	5	.06	43099	45056	53190	59577
TERR.	143	1.85	1232632	1288610	1521242	1703893
FED.	73	.94	629246	657822	776578	869820
CROWN CORP	18	.23	155156	162203	191485	214476
COMMUNITY	84	1.08	724063	756946	893597	1000888
INDUSTRIAL	1	.01	8620	9011	10638	11915
COMMERCIAL	27	.35	232735	243304	287228	321714
PRIVATE	31	.40	267214	279349	329780	369376
OTHER - @	839	10.83	7232014	7560445	8925332	9996970
SUBTOTAL	1221	15.76	10524778	11002746	12989070	14548629
TOTAL OF BUILDINGS	7746	100.00				

EST.FUEL(1.)1983= 66768984
EST.FUEL(1.)1985= 69801204
EST.FUEL(1.)1995= 82402406
EST.FUEL(1.)2005= 92296217

* - SOURCE: DIEUS 82/83 DATA AND YK ASSESSMENT LISTS
** - DERIVED PROPORTIONALLY FROM DIEUS-BASED AND PROJECTED FIGURES FROM ACTIVITY 1 TABLE
@ - ASSUMED RESIDENTIAL, COMMERCIAL AND COMMUNITY USES TO BE
.5, .25 & .25 OF OVERALL YK ASSESSMENT ROLE ENTRIES, RESPECTIVELY

TABLE 4A - S.A.B. FUEL QUANTITIES (GALS.) BY USE SECTOR *

COMMUNITY	RESIDENTIAL	%	COMMERCIAL	%	UNID.	%	TOTAL
ARCTIC RED RIVER	9,253	36.373	12,872	50.599	3,314	13.027	25,439
COLVILLE LAKE		.000		.000		.000	1,381
DETAH	N.A.	ERROR		ERROR		ERROR	
ENTERPRISE		.000		.000		.000	20,204
FORT FRANKLIN	61,981	ERROR	73,800	ERROR		ERROR	
FORT GOOD HOPE	41,989	35.765	48,583	41.382	26,909	22.921	117,401
FORT LIARD	2,324	5.691	30,062	73.618	8,449	20.691	40,835
FORT MCPHERSON	131,501	37.629	210,676	60.285	7,289	2.086	349,466
FORT NORMAN	59,960	48.209	54,559	43.867	9,855	7.924	124,374
FORT PROVIDENCE	100,722	22.551	345,912	77.449	0	.000	446,634
FORT RESOLUTION	76,164	35.422	138,457	64.393	397	.185	215,018
FORT SIMPSON	37,382	4.480	647,345	77.172	153,902	18.347	838,829
FORT SMITH	113,501	10.374	746,910	68.268	233,668	21.358	1,094,079
HAY RIVER	269,981	13.778	1,514,622	77.298	174,864	8.924	1,959,467
HAY RIVER VILLAGE	N.A.	ERROR		ERROR		ERROR	
JEAN-MARIE RIVER	0	.000	5,534	100.000	0	.000	5,534
KAKISA	N.A.	ERROR		ERROR		ERROR	
LAC LA MARTRE	4,888	24.815	14,810	75.185	0	.000	19,698
MAHANNI BUTTE		.000		.000		.000	9,136
NORMAN WELLS	11,612	.335	3,429,185	99.062	20,869	.603	3,461,666
PINE POINT	3,504	2.803	121,504	97.203	0	.000	125,000
RAE LAKES		ERROR		ERROR		ERROR	
RAE-EDZO	40,432	34.005	78,467	65.995	0	.000	118,899
SNARE LAKES	N.A.	ERROR		ERROR		ERROR	
SNOWDRIFT	14,331	26.260	36,329	66.568	3,914	7.172	54,574
TROUT LAKE	0	.000	1,060	100.000	0	.000	1,060
WRIGLEY	5,275	20.002	19,347	73.362	1,750	6.636	26,372
YELLOWKNIFE	1,084,077	17.877	3,821,937	63.027	1,157,928	19.095	6,063,942
TOTAL(GALS.)	2,069,077	13.685	11,351,971	75.084	1,803,108	11.926	15,119,008
TOTAL(LITRES)	9,406,210		51,607,082		8,197,091		68,732,371

* - sourced from the GNWT Science Advisory Board 1980 Energy Study

TABLE 4B - BREAKDOWN OF CURRENT FUEL CONSUMPTION
BY COMMUNITY AND USE SECTOR

TOT EST FUEL= 66,768,984

COMMUNITY	PROJ.TOT*	RESIDENTIAL	% **	COMMERCIAL	% **	UNID.	% **
ARCTIC RED RIVER	149559	54,399	36.373	75,675	50.599	19,483	13.027
COLVILLE LAKE	4909	1,636	33.333	1,636	33.333	1,636	33.333
DETAH	232287	77,428	33.333	77,428	33.333	77,428	33.333
ENTERPRISE	79550	26,516	33.333	26,516	33.333	26,516	33.333
FORT FRANKLIN	1163120	387,703	33.333	387,703	33.333	387,703	33.333
FORT GOOD HOPE	1008955	360,853	35.765	417,526	41.382	231,263	22.921
FORT LIARD	730157	41,553	5.691	537,527	73.618	151,077	20.691
FORT MCPHERSON	1290954	485,773	37.629	778,252	60.285	26,929	2.086
FORT NORMAN	1392724	671,418	48.209	610,946	43.867	110,359	7.924
FORT PROVIDENCE	700000	157,857	22.551	542,143	77.449	233,331	33.333
FORT RESOLUTION	1033300	366,016	35.422	665,373	64.393	1,912	.185
FORT SIMPSON	1227444	54,989	4.480	947,243	77.172	225,199	18.347
FORT SMITH	5000000	518,700	10.374	3,413,400	68.268	1,067,900	21.358
HAY RIVER	8907922	1,227,333	13.778	6,885,646	77.298	794,943	8.924
HAY RIVER VILLAGE	30000	10,000	33.333	10,000	33.333	10,000	33.333
JEAN-MARIE RIVER	86626	1	.001	86,626	100.000	1	.001
KAKISA	100	33	33.333	33	33.333	33	33.333
LAC LA MARTRE	507078	125,831	24.815	381,247	75.185	169,024	33.333
NAHANNI BUTTE	147625	49,208	33.333	49,208	33.333	49,208	33.333
NORMAN WELLS	100	0	.335	99	99.062	1	.603
PINE POINT	3223100	90,343	2.803	3,132,950	97.203	0	.000
RAE LAKES	215775	71,924	33.333	71,924	33.333	71,924	33.333
RAE-EDZO	2078715	706,867	34.005	1,371,848	65.995	0	.000
SNARE LAKES	100	33	33.333	33	33.333	33	33.333
SNOWDRIFT	672896	176,702	26.260	447,933	66.568	48,260	7.172
TROUT LAKE	41000	0	.001	41,000	100.000	0	.000
WRIGLEY	476271	95,264	20.002	349,402	73.362	31,605	6.636
YELLOWKNIFE	36368717	6,501,636	17.877	22,922,111	63.027	6,944,607	19.095
TOTAL(LITRES)		12,260,020		44,231,429		10,680,376	

* - projected community totals sourced from TABLE 2, Without/Conservation Scenario
** - % breakdowns as per 1980 Science Advisory Board study

TABLE 4C - BREAKDOWN OF 1985 FUEL PROJECTIONS
BY COMMUNITY AND USE SECTOR

TOT EST FUEL= 69,801,204

COMMUNITY	PROJ.TOT*	RESIDENTIAL	% **	COMMERCIAL	% **	UNID.	% **
ARCTIC RED RIVER	157164	57,165	36.373	79,523	50.599	20,474	13.027
COLVILLE LAKE	4909	1,636	33.333	1,636	33.333	1,636	33.333
DETAH	241833	80,610	33.333	80,610	33.333	80,610	33.333
ENTERPRISE	83009	27,669	33.333	27,669	33.333	27,669	33.333
FORT FRANKLIN	1227164	409,051	33.333	409,051	33.333	409,051	33.333
FORT GOOD HOPE	1050955	375,874	35.765	434,906	41.382	240,889	22.921
FORT LIARD	762135	43,373	5.691	561,069	73.618	157,693	20.691
FORT MCPHERSON	1359622	511,612	37.629	819,648	60.285	28,362	2.086
FORT NORMAN	1436398	692,473	48.209	630,105	43.867	113,820	7.924
FORT PROVIDENCE	737984	166,423	22.551	571,561	77.449	245,992	33.333
FORT RESOLUTION	1077766	381,766	35.422	694,006	64.393	1,994	.185
FORT SIMPSON	1292357	57,898	4.480	997,338	77.172	237,109	18.347
FORT SMITH	5224507	541,990	10.374	3,566,666	68.268	1,115,850	21.358
HAY RIVER	9322640	1,284,473	13.778	7,206,214	77.298	831,952	8.924
HAY RIVER VILLAGE	30000	10,000	33.333	10,000	33.333	10,000	33.333
JEAN-MARIE RIVER	91436	1	.001	91,436	100.000	1	.001
KAKISA	100	33	33.333	33	33.333	33	33.333
LAC LA MARTRE	524326	130,111	24.815	394,215	75.185	174,774	33.333
NAHANNI BUTTE	154186	51,395	33.333	51,395	33.333	51,395	33.333
NORMAN WELLS	104	0	.335	103	99.062	1	.603
PINE POINT	3362699	94,256	2.803	3,268,644	97.203	0	.000
RAE LAKES	222090	74,029	33.333	74,029	33.333	74,029	33.333
RAE-EDZO	2176716	740,192	34.005	1,436,524	65.995	0	.000
SNARE LAKES	105	35	33.333	35	33.333	35	33.333
SNOWDRIFT	704193	184,921	26.260	468,767	66.568	50,505	7.172
TROUT LAKE	43689	0	.001	43,689	100.000	0	.000
WRIGLEY	492808	98,571	20.002	361,534	73.362	32,703	6.636
YELLOWKNIFE	38020267	6,796,883	17.877	23,963,034	63.027	7,259,970	19.095
TOTAL(LITRES)		12,812,444		46,243,441		11,166,547	

* - projected community totals sourced from TABLE 2, Without/Conservation Scenario
** - % breakdowns as per 1980 Science Advisory Board study

TABLE 4D - BREAKDOWN OF 1995 FUEL PROJECTIONS
BY COMMUNITY AND USE SECTOR

TOT EST FUEL= 82,402,406

COMMUNITY	PROJ.TOT	RESIDENTIAL	%	COMMERCIAL	%	UNID.	%
ARCTIC RED RIVER	197722	71,917	36.373	100,045	50.599	25,757	13.027
COLVILLE LAKE	4576	1,525	33.333	1,525	33.333	1,525	33.333
DETAH	294336	98,111	33.333	98,111	33.333	98,111	33.333
ENTERPRISE	77821	25,940	33.333	25,940	33.333	25,940	33.333
FORT FRANKLIN	1549449	516,478	33.333	516,478	33.333	516,478	33.333
FORT GOOD HOPE	1280303	457,900	35.765	529,815	41.382	293,458	22.921
FORT LIARD	952224	54,191	5.691	701,008	73.618	197,025	20.691
FORT MCPHERSON	1695113	637,854	37.629	1,021,899	60.285	35,360	2.086
FORT NORMAN	1773087	854,788	48.209	777,800	43.867	140,499	7.924
FORT PROVIDENCE	945271	213,168	22.551	732,103	77.449	315,087	33.333
FORT RESOLUTION	1312799	465,020	35.422	845,351	64.393	2,429	.185
FORT SIMPSON	1588596	71,169	4.480	1,225,951	77.172	291,460	18.347
FORT SMITH	6214855	644,729	10.374	4,242,757	68.268	1,327,369	21.358
HAY RIVER	10970151	1,511,467	13.778	8,479,707	77.298	978,976	8.924
HAY RIVER VILLAGE	30000	10,000	33.333	10,000	33.333	10,000	33.333
JEAN-MARIE RIVER	113095	1	.001	113,095	100.000	1	.001
KAKISA	91	30	33.333	30	33.333	30	33.333
LAC LA MARTRE	632985	157,075	24.815	475,910	75.185	210,993	33.333
MAHANNI BUTTE	191913	63,970	33.333	63,970	33.333	63,970	33.333
NORMAN WELLS	106	0	.335	105	99.062	1	.603
PINE POINT	3988843	111,807	2.803	3,877,275	97.203	0	.000
RAE LAKES	268403	89,467	33.333	89,467	33.333	89,467	33.333
RAE-EDZO	2657056	903,532	34.005	1,753,524	65.995	0	.000
SNARE LAKES	125	42	33.333	42	33.333	42	33.333
SNOWDRIFT	868505	228,069	26.260	578,146	66.568	62,289	7.172
TROUT LAKE	54443	1	.001	54,443	100.000	0	.000
WRIGLEY	585416	117,095	20.002	429,473	73.362	38,848	6.636
YELLOWKNIFE	44152121	7,893,075	17.877	27,827,757	63.027	8,430,848	19.095
TOTAL(LITRES)		15,198,422		54,571,729		13,155,963	

* - projected community totals sourced from TABLE 2, Without/Conservation Scenario
** - % breakdowns as per 1980 Science Advisory Board study

TABLE 4E - BREAKDOWN OF 2005 FUEL PROJECTIONS
BY COMMUNITY AND USE SECTOR

TOT EST FUEL= 92,296,217

COMMUNITY	PROJ.TOT*	RESIDENTIAL	% **	COMMERCIAL	% **	UNID.	% **
ARCTIC RED RIVER	231943	84,365	36.373	117,361	50.599	30,215	13.027
COLVILLE LAKE	5575	1,858	33.333	1,858	33.333	1,858	33.333
DETAH	342066	114,021	33.333	114,021	33.333	114,021	33.333
ENTERPRISE	70903	23,634	33.333	23,634	33.333	23,634	33.333
FORT FRANKLIN	1745713	581,899	33.333	581,899	33.333	581,899	33.333
FORT GOOD HOPE	1435086	513,259	35.765	593,867	41.382	328,936	22.921
FORT LIARD	1103230	62,785	5.691	812,176	73.618	228,269	20.691
FORT MCPHERSON	1944279	731,613	37.629	1,172,109	60.285	40,558	2.086
FORT NORMAN	2076954	1,001,279	48.209	911,097	43.867	164,578	7.924
FORT PROVIDENCE	1095039	246,942	22.551	848,097	77.449	365,009	33.333
FORT RESOLUTION	1490662	528,022	35.422	959,882	64.393	2,758	.185
FORT SIMPSON	1804579	80,845	4.480	1,392,630	77.172	331,086	18.347
FORT SMITH	7001679	726,354	10.374	4,779,906	68.268	1,495,419	21.358
HAY RIVER	12322247	1,697,759	13.778	9,524,850	77.298	1,099,637	8.924
HAY RIVER VILLAGE	30000	10,000	33.333	10,000	33.333	10,000	33.333
JEAN-MARIE RIVER	135955	1	.001	135,955	100.000	1	.001
KAKISA	79	26	33.333	26	33.333	26	33.333
LAC LA MARTRE	750268	186,179	24.815	564,089	75.185	250,087	33.333
NAHANNI BUTTE	219797	73,265	33.333	73,265	33.333	73,265	33.333
NORMAN WELLS	143	0	.335	142	99.062	1	.603
PINE POINT	4424064	124,007	2.803	4,300,323	97.203	0	.000
RAE LAKES	315768	105,255	33.333	105,255	33.333	105,255	33.333
RAE-EDZO	3131875	1,064,994	34.005	2,066,881	65.995	0	.000
SNARE LAKES	143	48	33.333	48	33.333	48	33.333
SNOWDRIFT	1032817	271,218	26.260	687,526	66.568	74,074	7.172
TROUT LAKE	63852	21,284	33.333	63,852	100.000	0	.000
WRIGLEY	681332	136,280	20.002	499,839	73.362	45,213	6.636
YELLOWKNIFE	48840168	8,731,157	17.877	30,782,493	63.027	9,326,030	19.095
TOTAL(LITRES)		17,118,348		61,123,079		14,691,877	

* - projected community totals sourced from TABLE 2, Without/Conservation Scenario
** - % breakdowns as per 1980 Science Advisory Board study

TABLE 4-1 ARCTIC RED RIVER FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	30	100.00	54,399			57,165			71,917			84,365		
NWTHC	17	56.67	30,826			32,394			40,753			47,807		
TERR.	3	10.00	5,440			5,717			7,192			8,437		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	3.33	1,813			1,906			2,397			2,812		
PRIVATE	9	30.00	16,320			17,150			21,575			25,310		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	12	100.00		75,675			79,523			100,045			117,361	
NWTHC	0	.00		0			0			0			0	
TERR.	7	58.33		44,144			46,388			58,360			68,461	
FED.	0	.00		0			0			0			0	
CROWN CORP	3	25.00		18,919			19,881			25,011			29,340	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	2	16.67		12,613			13,254			16,674			19,560	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	8	100.00			19,483			20,474			25,757			30,215
NWTHC	1	12.50			2,435			2,559			3,220			3,777
TERR.	3	37.50			7,306			7,678			9,659			11,331
FED.	1	12.50			2,435			2,559			3,220			3,777
CROWN CORP	1	12.50			2,435			2,559			3,220			3,777
COMMUNITY	0	.00			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	2	25.00			4,871			5,119			6,439			7,554
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	50													

TABLE 4-2 COLVILLE LAKE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	25	100.00	1,636			1,636			1,525			1,858		
NWTHC	0	.00	0			0			0			0		
TERR.	0	.00	0			0			0			0		
FED.	0	.00	0			0			0			0		
CROWN CORP	1	4.00	65			65			61			74		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	6	24.00	393			393			366			446		
PRIVATE	18	72.00	1,178			1,178			1,098			1,338		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	1	100.00		1,636			1,636			1,525			1,858	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	1	100.00		1,636			1,636			1,525			1,858	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	6	100.00			1,636			1,636			1,525			1,858
NWTHC	0	.00			0			0			0			0
TERR.	0	.00			0			0			0			0
FED.	1	16.67			273			273			254			310
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	0	.00			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	5	83.33			1,363			1,363			1,271			1,548
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	32													

TABLE 4-3 DETAH FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	28	100.0C	77,428			80,610			98,111			114,021		
NWTHC	0	.00	0			0			0			0		
TERR.	5	17.86	13,826			14,395			17,520			20,361		
FED.	1	3.57	2,765			2,879			3,504			4,072		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	22	78.57	60,836			63,336			77,087			89,588		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	1	100.00		77,428			80,610			98,111			114,021	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	1	100.00		77,428			80,610			98,111			114,021	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	5	100.00			77,428			80,610			98,111			114,021
NWTHC	0	.00			0			0			0			0
TERR.	2	40.00			30,971			32,244			39,244			45,608
FED.	0	.00			0			0			0			0
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	2	40.00			30,971			32,244			39,244			45,608
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	20.00			15,486			16,122			19,622			22,804
OTHER - @	0	.00			0			0			0			0
TOTAL	34													

TABLE 4-4 ENTERPRISE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	17	100.00	26,516			27,669			25,940			23,634		
NWTHC	0	.00	0			0			0			0		
TERR.	1	5.88	1,560			1,628			1,526			1,390		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	16	94.12	24,956			26,041			24,414			22,244		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	4	100.00		26,516			27,669			25,940			23,634	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL -	0	.00		0			0			0			0	
COMMERCIAL	4	100.00		26,516			27,669			25,940			23,634	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0							
UNID. + COMMUNITY	0				26,516			27,669			25,940			23,634
NWTHC	0													
TERR.	0													
FED.	0													
CROWN CORP	0													
COMMUNITY	0													
INDUSTRIAL	0													
COMMERCIAL	0													
PRIVATE	0													
OTHER - @	0													
TOTAL	21													

TABLE 4-5 FORT FRANKLIN FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	108	100.00	387,703			409,051			516,478			581,899		
NWTHC	67	62.04	240,519			253,763			320,408			360,993		
TERR.	11	10.19	39,488			41,663			52,604			59,267		
FED.	0	.00	0			0			0			0		
CROWN CORP	3	2.78	10,770			11,363			14,347			16,164		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	5	4.63	17,949			18,938			23,911			26,940		
PRIVATE	22	20.37	78,977			83,325			105,208			118,535		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	16	100.00		387,703			409,051			516,478			581,899	
NWTHC	0	.00		0			0			0			0	
TERR.	2	12.50		48,463			51,131			64,560			72,737	
FED.	0	.00		0			0			0			0	
CROWN CORP	5	31.25		121,157			127,828			161,399			181,843	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	9	56.25		218,083			230,091			290,519			327,318	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	16	100.00			387,703			409,051			516,478			581,899
NWTHC	0	.00			0			0			0			0
TERR.	9	56.25			218,083			230,091			290,519			327,318
FED.	1	6.25			24,231			25,566			32,280			36,369
CROWN CORP	3	18.75			72,694			76,697			96,840			109,106
COMMUNITY	1	6.25			24,231			25,566			32,280			36,369
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	2	12.50			48,463			51,131			64,560			72,737
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	140													

TABLE 4-6 FORT GOOD HOPE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	131	100.00	360,853			375,874			457,900			513,259		
NWTHC	27	20.61	74,374			77,470			94,376			105,786		
TERR.	18	13.74	49,583			51,647			62,918			70,524		
FED.	3	2.29	8,264			8,608			10,486			11,754		
CROWN CORP	3	2.29	8,264			8,608			10,486			11,754		
COMMUNITY	2	1.53	5,509			5,739			6,991			7,836		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	6	4.58	16,528			17,216			20,973			23,508		
PRIVATE	72	54.96	198,331			206,587			251,670			282,097		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	20	100.00		417,526			434,906			529,815			593,867	
NWTHC	0	.00		0			0			0			0	
TERR.	6	30.00		125,258			130,472			158,945			178,160	
FED.	2	10.00		41,753			43,491			52,982			59,387	
CROWN CORP	5	25.00		104,382			108,727			132,454			148,467	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	7	35.00		146,134			152,217			185,435			207,853	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	17	100.00			231,263			240,889			293,458			328,936
NWTHC	0	.00			0			0			0			0
TERR.	10	58.82			136,037			141,699			172,622			193,492
FED.	1	5.88			13,604			14,170			17,262			19,349
CROWN CORP	4	23.53			54,415			56,680			69,049			77,397
COMMUNITY	0	.00			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	2	11.76			27,207			28,340			34,524			38,698
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	168													

TABLE 4-7 FORT LIARD FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	84	100.00	41,553			43,373			54,191			62,785		
NWTHC	14	16.67	6,926			7,229			9,032			10,464		
TERR.	5	5.95	2,473			2,582			3,226			3,737		
FED.	6	7.14	2,968			3,098			3,871			4,485		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	1.19	495			516			645			747		
PRIVATE	58	69.05	28,691			29,948			37,418			43,352		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	4	100.00		537,527			561,069			701,008			812,176	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	4	100.00		537,527			561,069			701,008			812,176	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	15	100.00			151,077			157,693			197,025			228,269
NWTHC	0	.00			0			0			0			0
TERR.	3	20.00			30,215			31,539			39,405			45,654
FED.	7	46.67			70,503			73,590			91,945			106,326
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	4	26.67			40,287			42,051			52,540			60,872
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	6.67			10,072			10,513			13,135			15,218
OTHER - @	0	.00			0			0			0			0
TOTAL	103													

TABLE 4-8 FORT MCPHERSON FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	165	100.00	485,773			511,612			637,854			731,613		
NWTHC	62	37.58	182,533			192,242			239,678			274,909		
TERR.	17	10.30	50,049			52,712			65,718			75,378		
FED.	1	.61	2,944			3,101			3,866			4,434		
CROWN CORP	5	3.03	14,720			15,503			19,329			22,170		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	2	1.21	5,888			6,201			7,732			8,868		
PRIVATE	78	47.27	229,638			241,853			301,531			345,853		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	35	100.00		778,252			819,648			1,021,899			1,172,109	
NWTHC	0	.00		0			0			0			0	
TERR.	20	57.14		444,715			468,370			583,942			669,777	
FED.	2	5.71		44,472			46,837			58,394			66,978	
CROWN CORP	1	2.86		22,236			23,419			29,197			33,489	
COMMUNITY	1	2.86		22,236			23,419			29,197			33,489	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	7	20.00		155,650			163,930			204,380			234,422	
PRIVATE	4	11.43		88,943			93,674			116,788			133,955	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	19	100.00			26,929			28,362			35,360			40,558
NWTHC	0	.00			0			0			0			0
TERR.	5	26.32			7,087			7,464			9,305			10,673
FED.	3	15.79			4,252			4,478			5,583			6,404
CROWN CORP	3	15.79			4,252			4,478			5,583			6,404
COMMUNITY	5	26.32			7,087			7,464			9,305			10,673
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	3	15.79			4,252			4,478			5,583			6,404
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	219													

TABLE 4-9 FORT NORMAN FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	89	100.00	671,418			692,473			854,788			1,001,279		
NWTHC	40	44.94	301,761			311,224			384,174			450,013		
TERR.	12	13.48	90,528			93,367			115,252			135,004		
FED.	3	3.37	22,632			23,342			28,813			33,751		
CROWN CORP	2	2.25	15,088			15,561			19,209			22,501		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	7	7.87	52,808			54,464			67,231			78,752		
PRIVATE	25	28.09	188,601			194,515			240,109			281,258		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	4	100.00		610,946			630,105			777,800			911,097	
NWTHC	1	25.00		152,737			157,526			194,450			227,774	
TERR.	1	25.00		152,737			157,526			194,450			227,774	
FED.	0	.00		0			0			0			0	
CROWN CORP	1	25.00		152,737			157,526			194,450			227,774	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	1	25.00		152,737			157,526			194,450			227,774	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	20	100.00			110,359			113,820			140,499			164,578
NWTHC	0	.00			0			0			0			0
TERR.	10	50.00			55,180			56,910			70,250			82,289
FED.	2	10.00			11,036			11,382			14,050			16,458
CROWN CORP	3	15.00			16,554			17,073			21,075			24,687
COMMUNITY	3	15.00			16,554			17,073			21,075			24,687
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	2	10.00			11,036			11,382			14,050			16,458
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	113													

TABLE 4-10 FORT PROVIDENCE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	107	100.00	157,857			166,423			213,168			246,942		
NWTHC	91	85.05	134,252			141,537			181,292			210,016		
TERR.	6	5.61	8,852			9,332			11,953			13,847		
FED.	2	1.87	2,951			3,111			3,984			4,616		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	8	7.48	11,802			12,443			15,938			18,463		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	8	100.00		542,143			571,561			732,103			848,097	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	2	25.00		135,536			142,890			183,026			212,024	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	5	62.50		338,839			357,226			457,564			530,061	
PRIVATE	1	12.50		67,768			71,445			91,513			106,012	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	15	100.00			233,331			245,992			315,087			365,009
NWTHC	3	20.00			46,666			49,198			63,017			73,002
TERR.	5	33.33			77,777			81,997			105,029			121,670
FED.	2	13.33			31,111			32,799			42,012			48,668
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	4	26.67			62,222			65,598			84,023			97,336
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	6.67			15,555			16,399			21,006			24,334
OTHER - @	0	.00			0			0			0			0
TOTAL	130													

TABLE 4-11 FORT RESOLUTION FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	102	100.00	366,016			381,766			465,020			528,022		
NWTHC	43	42.16	154,301			160,941			196,038			222,598		
TERR.	0	.00	0			0			0			0		
FED.	4	3.92	14,354			14,971			18,236			20,707		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	.98	3,588			3,743			4,559			5,177		
PRIVATE	54	52.94	193,773			202,111			246,187			279,541		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	9	100.00		665,373			694,006			845,351			959,882	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	3	37.50		249,515			260,252			317,007			359,956	
PRIVATE	5	62.50		415,858			433,754			528,344			599,926	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	14	100.00			1,912			1,994			2,429			2,758
NWTHC	0	.00			0			0			0			0
TERR.	3	21.43			410			427			521			591
FED.	5	35.71			683			712			867			985
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	6	42.86			819			855			1,041			1,182
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	124													

TABLE 4-12 FORT SIMPSON FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	212	100.00	54,989			57,898			71,169			80,845		
NWTHC	33	15.57	8,560			9,012			11,078			12,584		
TERR.	9	4.25	2,334			2,458			3,021			3,432		
FED.	33	15.57	8,560			9,012			11,078			12,584		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	2	.94	519			546			671			763		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	3	1.42	778			819			1,007			1,144		
PRIVATE	132	62.26	34,238			36,050			44,313			50,337		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	28	100.00		947,243			997,338			1,225,951			1,392,630	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	1	3.57		33,830			35,619			43,784			49,737	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	25	89.29		845,753			890,480			1,094,599			1,243,420	
PRIVATE	2	7.14		67,660			71,238			87,568			99,474	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	30	100.00			225,199			237,109			291,460			331,086
NWTHC	0	.00			0			0			0			0
TERR.	9	30.00			67,560			71,133			87,438			99,326
FED.	9	30.00			67,560			71,133			87,438			99,326
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	6	20.00			45,040			47,422			58,292			66,217
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	2	6.67			15,013			15,807			19,431			22,072
PRIVATE	4	13.33			30,027			31,615			38,861			44,145
OTHER - @	0	.00			0			0			0			0
TOTAL	270													

TABLE 4-13 FORT SMITH FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	577	100.00	518,700			541,990			664,729			726,354		
NWTHC	2	.35	1,798			1,879			2,304			2,518		
TERR.	62	10.75	55,736			58,238			71,427			78,048		
FED.	75	13.00	67,422			70,449			86,403			94,413		
CROWN CORP	1	.17	899			939			1,152			1,259		
COMMUNITY	7	1.21	6,293			6,575			8,064			8,812		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	.17	899			939			1,152			1,259		
PRIVATE	429	74.35	385,654			402,970			494,227			540,045		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	34	100.00		3,413,400			3,566,666			4,242,757			4,779,906	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	1	2.94		100,394			104,902			124,787			140,585	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	1	2.94		100,394			104,902			124,787			140,585	
INDUSTRIAL	1	2.94		100,394			104,902			124,787			140,585	
COMMERCIAL	18	52.94		1,807,094			1,888,235			2,246,165			2,530,538	
PRIVATE	13	38.24		1,305,124			1,363,725			1,622,231			1,827,611	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	58	100.00			1,067,900			1,115,850			1,327,369			1,495,419
NWTHC	0	.00			0			0			0			0
TERR.	37	63.79			681,247			711,835			846,770			953,974
FED.	5	8.62			92,060			96,194			114,428			128,915
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	10	17.24			184,121			192,388			228,857			257,831
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	1	1.72			18,412			19,239			22,886			25,783
PRIVATE	5	8.62			92,060			96,194			114,428			128,915
OTHER - @	0	.00			0			0			0			0
TOTAL	669													

TABLE 4-14 HAY RIVER FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	795	100.00	1,227,333			1,284,473			1,511,467			1,697,759		
NWTHC	42	5.28	64,840			67,859			79,851			89,693		
TERR.	46	5.79	71,015			74,322			87,456			98,235		
FED.	58	7.30	89,541			93,710			110,271			123,862		
CROWN CORP	82	10.31	126,593			132,487			155,900			175,115		
COMMUNITY	4	.50	6,175			6,463			7,605			8,542		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	117	14.72	180,626			189,036			222,442			249,859		
PRIVATE	446	56.10	688,542			720,597			847,942			952,453		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	102	100.00		6,885,646			7,206,214			8,479,707			9,524,850	
NWTHC	0	.00		0			0			0			0	
TERR.	3	2.94		202,519			211,947			249,403			280,143	
FED.	1	.98		67,506			70,649			83,134			93,381	
CROWN CORP	14	13.73		945,089			989,088			1,163,881			1,307,332	
COMMUNITY	1	.98		67,506			70,649			83,134			93,381	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	83	81.37		5,603,026			5,863,880			6,900,154			7,750,613	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	45	100.00			794,943			831,952			978,976			1,099,637
NWTHC	0	.00			0			0			0			0
TERR.	13	28.89			229,650			240,342			282,815			317,673
FED.	9	20.00			158,989			166,390			195,795			219,927
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	8	17.78			141,323			147,903			174,040			195,491
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	8	17.78			141,323			147,903			174,040			195,491
PRIVATE	7	15.56			123,658			129,415			152,285			171,055
OTHER - @	0	.00			0			0			0			0
TOTAL	942													

TABLE 4-15 HAY RIVER RESERVE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	38	100.00	10,000			10,000			10,000			10,000		
NWTHC	0	.00	0			0			0			0		
TERR.	0	.00	0			0			0			0		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	38	100.00	10,000			10,000			10,000			10,000		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	0	.00	0			0			0			0		
OTHER - @	0	.00	0											
COMMERCIAL	1	100.00		10,000			10,000			10,000			10,000	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	1	100.00		10,000			10,000			10,000			10,000	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	0	.00		0			0			0			0	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0										
UNID. + COMMUNITY	4	100.00			10,000			10,000			10,000			10,000
NWTHC	0	.00			0			0			0			0
TERR.	0	.00			0			0			0			0
FED.	0	.00			0			0			0			0
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	4	100.00			10,000			10,000			10,000			10,000
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0									
TOTAL	43													

TABLE 4-16 JEAN-MARIE RIVER FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFI
RESIDENTIAL SUBTOT	15	100.00	28,875			30,478			37,698			45,318		
NWTHC	0	.00	0			0			0			0		
TERR.	0	.00	0			0			0			0		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	1	6.67	1,925			2,032			2,513			3,021		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	14	93.33	26,950			28,446			35,185			42,297		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	1	100.00		28,875			30,478			37,698			45,318	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	1	100.00		28,875			30,478			37,698			45,318	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	0	.00		0			0			0			0	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	6	100.00			28,875			30,478			37,698			45,318
NWTHC	0	.00			0			0			0			0
TERR.	2	33.33			9,625			10,159			12,566			15,106
FED.	1	16.67			4,813			5,080			6,283			7,553
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	2	33.33			9,625			10,159			12,566			15,106
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	16.67			4,813			5,080			6,283			7,553
OTHER - @	0	.00			0			0			0			0
TOTAL	22													

TABLE 4-17 KAKISA FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	7	100.00	33			33			30			26		
NWTHC	0	.00	0			0			0			0		
TERR.	0	.00	0			0			0			0		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	7	100.00	33			33			30			26		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	0			33			33			30			26	
NWTHC	0													
TERR.	0													
FED.	0													
CROWN CORP	0													
COMMUNITY	0													
INDUSTRIAL	0													
COMMERCIAL	0													
PRIVATE	0													
OTHER - @	0													
UNID. + COMMUNITY	0				33			33			30			26
NWTHC	0													
TERR.	0													
FED.	0													
CROWN CORP	0													
COMMUNITY	0													
INDUSTRIAL	0													
COMMERCIAL	0													
PRIVATE	0													
OTHER - @	0													
TOTAL	7													

TABLE 4-18 LAC LA MARTRE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	37	100.00	125,831			130,111			157,075			186,179		
NWTHC	4	10.81	13,603			14,066			16,981			20,127		
TERR.	0	.00	0			0			0			0		
FED.	3	8.11	10,203			10,550			12,736			15,096		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	30	81.08	102,025			105,495			127,358			150,956		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	2	100.00		381,247			394,215			475,910			564,089	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	2	100.00		381,247			394,215			475,910			564,089	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	11	100.00			169,024			174,744			210,993			250,087
NWTHC	0	.00			0			0			0			0
TERR.	3	27.27			46,097			47,657			57,544			68,206
FED.	4	36.36			61,463			63,543			76,725			90,941
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	3	27.27			46,097			47,657			57,544			68,206
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	9.09			15,366			15,886			19,181			22,735
OTHER - @	0	.00			0			0			0			0
TOTAL	50													

TABLE 4-19 NAHANNI BUTTE FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	22	100.00	49,208			51,395			63,970			73,265		
NWTHC	0	.00	0			0			0			0		
TERR.	1	4.55	2,237			2,336			2,908			3,330		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	4.55	2,237			2,336			2,908			3,330		
PRIVATE	20	90.91	44,735			46,723			58,155			66,605		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	4	100.00		49,208			51,395			63,970			73,265	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	1	25.00		12,302			12,849			15,993			18,316	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	3	75.00		36,906			38,546			47,978			54,949	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	7	100.00			49,208			51,395			63,970			73,265
NWTHC	0	.00			0			0			0			0
TERR.	5	71.43			35,149			36,711			45,693			52,332
FED.	0	.00			0			0			0			0
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	1	14.29			7,030			7,342			9,139			10,466
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	14.29			7,030			7,342			9,139			10,466
OTHER - @	0	.00			0			0			0			0
TOTAL	33													

TABLE 4-20 NORMAN WELLS FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	204	100.00	0			0			0			0		
NWTHC	15	7.35	0			0			0			0		
TERR.	18	8.82	0			0			0			0		
FED.	26	12.75	0			0			0			0		
CROWN CORP	4	1.96	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	114	55.88	0			0			0			0		
PRIVATE	27	13.24	0			0			0			0		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	83	100.00		99			103			105			142	
NWTHC	1	1.20		1			1			1			2	
TERR.	3	3.61		4			4			4			5	
FED.	12	14.46		14			15			15			21	
CROWN CORP	7	8.43		8			9			9			12	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	60	72.29		72			74			76			103	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	21	100.00			1			1			1			1
NWTHC	0	.00			0			0			0			0
TERR.	6	28.57			0			0			0			0
FED.	9	42.86			0			0			0			0
CROWN CORP	2	9.52			0			0			0			0
COMMUNITY	4	19.05			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	0	.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	308													

TABLE 4-21 PINE POINT FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	478	100.00	90,343			94,256			111,807			124,007		
NWTHC	34	7.11	6,426			6,704			7,953			8,821		
TERR.	0	.00	0			0			0			0		
FED.	5	1.05	945			986			1,170			1,297		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	8	1.67	1,512			1,578			1,871			2,075		
INDUSTRIAL	430	89.96	81,271			84,791			100,580			111,554		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	1	.21	189			197			234			259		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	8	100.00		3,132,950			3,268,644			3,877,275			4,300,323	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	4	50.00		1,566,475			1,634,322			1,938,638			2,150,162	
PRIVATE	4	50.00		1,566,475			1,634,322			1,938,638			2,150,162	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	10	100.00			0			0			0			0
NWTHC	0	.00			0			0			0			0
TERR.	2	20.00			0			0			0			0
FED.	1	10.00			0			0			0			0
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	3	30.00			0			0			0			0
INDUSTRIAL	1	10.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	3	30.00			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	496													

TABLE 4-22 RAE LAKES FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJ...		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	35	100.00	71,924			74,029			89,378			105,255		
NWTHC	0	.00	0			0			0			0		
TERR.	0	.00	0			0			0			0		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	35	100.00	71,924			74,029			89,378			105,255		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	1	100.00		71,924			74,029			89,378			105,255	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	1	100.00		71,924			74,029			89,378			105,255	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	0	.00		0			0			0			0	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	9	100.00			71,924			74,029			89,378			105,255
NWTHC	0	.00			0			0			0			0
TERR.	2	22.22			15,983			16,451			19,862			23,390
FED.	5	55.56			39,958			41,127			49,654			58,475
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	0	.00			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	11.11			7,992			8,225			9,931			11,695
OTHER - @	1	11.11			7,992			8,225			9,931			11,695
TOTAL	45													

TABLE 4-23 RAE-EDZO FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	199	100.00	706,867			740,192			903,532			1,064,994		
NWTHC	27	13.57	95,907			100,428			122,590			144,497		
TERR.	127	63.82	451,116			472,384			576,626			679,670		
FED.	2	1.01	7,104			7,439			9,081			10,703		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	.50	3,552			3,720			4,540			5,352		
PRIVATE	42	21.11	149,188			155,221			190,695			224,773		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	6	100.00		1,371,848			1,436,524			1,753,524			2,066,881	
NWTHC	0	.00		0			0			0			0	
TERR.	1	16.67		228,641			239,421			292,254			344,480	
FED.	1	16.67		228,641			239,421			292,254			344,480	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	4	66.67		914,565			957,683			1,169,016			1,377,921	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	15	60.00			0			0			0			0
NWTHC	1	6.67			0			0			0			0
TERR.	2	13.33			0			0			0			0
FED.	5	33.33			0			0			0			0
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	0	.00			0			0			0			0
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	6.67			0			0			0			0
OTHER - @	0	.00			0			0			0			0
TOTAL	220													

TABLE 4-24 SNARE LAKES FUEL PROJECTIONS (IN LITRES)

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	21	100.00	33			35			42			48		
NWTHC	0	.00	0			0			0			0		
TERR.	2	9.52	3			3			4			5		
FED.	0	.00	0			0			0			0		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	19	90.48	30			32			38			43		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	1	100.00		33			35			42			48	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	0	.00		0			0			0			0	
PRIVATE	0	.00		0			0			0			0	
OTHER - @	1	100.00		33			35			42			48	
UNID. + COMMUNITY	0				33			35			42			48
NWTHC	0													
TERR.	0													
FED.	0													
CROWN CORP	0													
COMMUNITY	0													
INDUSTRIAL	0													
COMMERCIAL	0													
PRIVATE	0													
OTHER - @	0													
TOTAL	22													

TABLE 4-25 SNOWDRIFT FUEL PROJECTIONS

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	37	100.00	176,702			184,921			228,069			271,218		
NWTHC	20	54.05	95,515			99,957			123,281			146,604		
TERR.	2	5.41	9,551			9,996			12,328			14,660		
FED.	1	2.70	4,776			4,998			6,164			7,330		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	1	2.70	4,776			4,998			6,164			7,330		
PRIVATE	13	35.14	62,084			64,972			80,132			95,293		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	2	100.00		447,933			468,767			578,146			687,526	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	1	50.00		223,967			234,384			289,073			343,763	
PRIVATE	1	50.00		223,967			234,384			289,073			343,763	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	12	100.00			48,260			50,505			62,289			74,074
NWTHC	0	.00			0			0			0			0
TERR.	6	50.00			24,130			25,253			31,145			37,037
FED.	2	16.67			8,043			8,418			10,382			12,346
CROWN CORP	0	.00			0			0			0			0
COMMUNITY	3	25.00			12,065			12,626			15,572			18,519
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	1	8.33			4,022			4,209			5,191			6,173
OTHER - @	0	.00			0			0			0			0
TOTAL	51													

TABLE 4-26 TROUT LAKE FUEL PROJECTIONS

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE		PROJECTED 1985 FUEL		PROJECTED 1995 FUEL		PROJECTED 2005 FUEL	
			RESIDENT.	COMMERC. UNIDENTIFIED	RESIDENT.	COMMERC. UNIDENTIFIED	RESIDENT.	COMMERC. UNIDENTIFIED	RESIDENT.	COMMERC. UNIDENTIFIED
RESIDENTIAL SUBTOT	20	80.00	13,667		14,563		18,147		21,284	
NNTHC	0	.00	0		0		0		0	
TERR.	1	5.00	683		728		907		1,064	
FED.	0	.00	0		0		0		0	
CROWN CORP	0	.00	0		0		0		0	
COMMUNITY	0	.00	0		0		0		0	
INDUSTRIAL	0	.00	0		0		0		0	
COMMERCIAL	0	.00	0		0		0		0	
PRIVATE	15	75.00	10,250		10,922		13,610		15,963	
OTHER - 0	0	.00	0		0		0		0	
COMMERCIAL	0	ERROR		41,000		43,689		54,443		63,852
NNTHC	0	ERROR		ERROR		ERROR		ERROR		ERROR
TERR.	0	ERROR		ERROR		ERROR		ERROR		ERROR
FED.	0	ERROR		ERROR		ERROR		ERROR		ERROR
CROWN CORP	0	ERROR		ERROR		ERROR		ERROR		ERROR
COMMUNITY	0	ERROR		ERROR		ERROR		ERROR		ERROR
INDUSTRIAL	0	ERROR		ERROR		ERROR		ERROR		ERROR
COMMERCIAL	0	ERROR		ERROR		ERROR		ERROR		ERROR
PRIVATE	0	ERROR		ERROR		ERROR		ERROR		ERROR
OTHER - 0	0	ERROR		ERROR		ERROR		ERROR		ERROR
UNID. + COMMUNITY	4	100.00		0		0		0		0
NNTHC	0	.00		0		0		0		0
TERR.	1	25.00		0		0		0		0
FED.	0	.00		0		0		0		0
CROWN CORP	0	.00		0		0		0		0
COMMUNITY	2	50.00		0		0		0		0
INDUSTRIAL	0	.00		0		0		0		0
COMMERCIAL	0	.00		0		0		0		0
PRIVATE	1	25.00		0		0		0		0
OTHER - 0	0	.00		0		0		0		0
TOTAL	24									

TABLE 4-27 WRIGLEY FUEL PROJECTIONS

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	43	100.00	95,264			98,571			117,095			136,280		
NWTHC	6	13.95	13,293			13,754			16,339			19,016		
TERR.	5	11.63	11,077			11,462			13,616			15,847		
FED.	3	6.98	6,646			6,877			8,169			9,508		
CROWN CORP	0	.00	0			0			0			0		
COMMUNITY	0	.00	0			0			0			0		
INDUSTRIAL	0	.00	0			0			0			0		
COMMERCIAL	0	.00	0			0			0			0		
PRIVATE	29	67.44	64,248			66,478			78,971			91,910		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	2	100.00		349,402			361,534			429,473			499,839	
NWTHC	0	.00		0			0			0			0	
TERR.	0	.00		0			0			0			0	
FED.	0	.00		0			0			0			0	
CROWN CORP	0	.00		0			0			0			0	
COMMUNITY	0	.00		0			0			0			0	
INDUSTRIAL	0	.00		0			0			0			0	
COMMERCIAL	1	50.00		174,701			180,767			214,737			249,920	
PRIVATE	1	50.00		174,701			180,767			214,737			249,920	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	15	100.00			31,605			32,703			38,848			45,213
NWTHC	0	.00			0			0			0			0
TERR.	5	33.33			10,535			10,901			12,949			15,071
FED.	2	13.33			4,214			4,360			5,180			6,028
CROWN CORP	2	13.33			4,214			4,360			5,180			6,028
COMMUNITY	4	26.67			8,428			8,721			10,359			12,057
INDUSTRIAL	0	.00			0			0			0			0
COMMERCIAL	0	.00			0			0			0			0
PRIVATE	2	13.33			4,214			4,360			5,180			6,028
OTHER - @	0	.00			0			0			0			0
TOTAL	60	-												

TABLE 4-28 YELLOWKNIFE FUEL PROJECTIONS

USE SECTOR & OWNERSHIP	# UNITS	% OF TOTAL	CURRENT FUEL USE			PROJECTED 1985 FUEL			PROJECTED 1995 FUEL			PROJECTED 2005 FUEL		
			RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED	RESIDENT.	COMMERC.	UNIDENTIFIED
RESIDENTIAL SUBTOT	1,768	59.28	6,501,636			6,796,883			7,893,075			8,731,157		
NWTHC	179	10.12	658,254			688,146			799,129			883,980		
TERR.	202	11.43	742,834			776,567			901,811			997,564		
FED.	293	16.57	1,077,477			1,126,407			1,308,072			1,446,962		
CROWN CORP	9	.51	33,097			34,600			40,180			44,446		
COMMUNITY	43	2.43	158,128			165,309			191,970			212,353		
INDUSTRIAL	50	2.83	183,870			192,220			223,220			246,922		
COMMERCIAL	199	11.26	731,802			765,034			888,417			982,749		
PRIVATE	73	4.13	268,450			280,641			325,902			360,506		
OTHER - @	0	.00	0			0			0			0		
COMMERCIAL	795	100.00		22,922,111			23,963,034			27,827,757			30,782,493	
NWTHC	0	.00		0			0			0			0	
TERR.	101	12.70		2,912,117			3,044,360			3,535,350			3,910,732	
FED.	147	18.49		4,238,428			4,430,901			5,145,310			5,691,857	
CROWN CORP	5	.63		144,164			150,711			175,017			193,601	
COMMUNITY	22	2.77		634,323			663,128			770,076			851,843	
INDUSTRIAL	25	3.14		720,821			753,555			875,087			968,003	
COMMERCIAL	99	12.45		2,854,452			2,984,076			3,465,343			3,833,292	
PRIVATE	396	49.81		11,417,806			11,936,304			13,861,373			15,333,166	
OTHER - @	0	.00		0			0			0			0	
UNID. + COMMUNITY	791	100.00			6,944,607			7,259,970			8,430,848			9,326,030
NWTHC	1	.13			8,780			9,178			10,658			11,790
TERR.	101	12.77			886,732			927,000			1,076,505			1,190,808
FED.	146	18.46			1,281,811			1,340,020			1,556,136			1,721,366
CROWN CORP	4	.51			35,118			36,713			42,634			47,161
COMMUNITY	21	2.65			184,370			192,743			223,828			247,594
INDUSTRIAL	24	3.03			210,709			220,277			255,803			282,964
COMMERCIAL	99	12.52			869,173			908,644			1,055,188			1,167,228
PRIVATE	395	49.94			3,467,914			3,625,396			4,210,095			4,657,120
OTHER - @	0	.00			0			0			0			0
TOTAL	3,354													

TABLE 5 - BUILDING USE SECTOR AND OWNERSHIP BY COMMUNITY

EXPRESSED IN NUMBERS OF BUILDING UNITS - **

USE SECTOR & OWNERSHIP	COMMUNITIES BY NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24 ***	25	26	27	28 *	TOTAL
RESIDENTIAL																													
NWTHC	17	0	0	0	67	27	14	62	40	91	43	33	2	42	0	0	0	4	0	15	34	0	27		20	0	6	179	723
TERR.	3	0	5	1	11	18	5	17	12	6	0	9	62	46	0	0	0	0	1	18	0	0	127	2	2	1	5	202	553
FED.	0	0	1	0	0	3	6	1	3	2	4	33	75	58	0	0	0	3	0	26	5	0	2		1	0	3	293	519
CROWN CORP	0	1	0	0	3	3	0	5	2	0	0	0	1	82	0	0	0	0	0	4	0	0	0		0	0	0	9	110
COMMUNITY	0	0	0	0	0	2	0	0	0	0	0	2	7	4	38	1	0	0	0	0	8	0	0		0	0	0	43	105
INDUSTRIAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	430	0	0		0	0	0	50	480
COMMERCIAL	1	6	0	0	5	6	1	2	7	0	1	3	1	117	0	0	0	0	1	114	0	0	1		1	0	0	199	466
PRIVATE	9	18	22	16	22	72	58	78	25	8	54	132	429	446	0	14	7	30	20	27	1	35	42	19	13	15	29	793	2434
OTHER																													0
SUB-TOTAL	30	25	28	17	108	131	84	165	89	107	102	212	577	795	38	15	7	37	22	204	478	35	199	21	37	16	43	1768	5390
COMMERCIAL																													
NWTHC	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0		0	0	0	0	2
TERR.	7	0	0	0	2	6	0	20	1	0	0	0	0	3	0	0	0	0	0	3	0	0	1		0	0	0	101	144
FED.	0	0	0	0	0	2	0	2	0	0	0	1	1	1	0	1	0	0	0	12	0	0	1		0	0	0	147	168
CROWN CORP	3	0	0	0	5	5	0	1	1	0	0	0	0	14	0	0	0	0	1	7	0	0	0		0	0	0	5	42
COMMUNITY	0	0	0	0	0	0	0	1	0	2	0	0	1	1	1	0	0	0	0	0	0	0	1		0	0	0	22	29
INDUSTRIAL	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		0	0	0	25	26
COMMERCIAL	2	1	1	4	9	7	4	7	1	5	3	25	18	83	0	0	0	2	3	60	4	0	4		1	0	1	99	344
PRIVATE	0	0	0	0	0	0	0	4	0	1	5	2	13	0	0	0	0	0	0	0	4	0	0		1	0	1	396	427
OTHER																								1					1
SUB-TOTAL	12	1	1	4	16	20	4	35	4	8	8	28	34	102	1	1	0	2	4	83	8	1	6	1	2	0	2	795	1183
COMMUNITY																													
NWTHC	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	0	1	6
TERR.	3	0	2	0	9	10	3	5	10	5	3	9	37	13	0	2	0	3	5	6	2	2	2		6	1	5	101	244
FED.	1	1	0	0	1	1	7	3	2	2	5	9	5	9	0	1	0	4	0	9	1	3	5		2	0	2	146	219
CROWN CORP	1	0	0	0	3	4	0	3	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0		0	0	2	4	22
COMMUNITY	0	0	2	0	1	0	4	5	3	4	6	6	10	8	4	2	0	3	1	4	3	3	6		3	2	4	21	105
INDUSTRIAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	24	25
COMMERCIAL	2	5	0	0	2	2	0	3	2	0	0	2	1	8	0	0	0	0	0	0	0	0	0		0	0	0	99	126
PRIVATE	0	0	1	0	0	0	1	0	0	1	0	4	5	7	0	1	0	1	1	0	3	1	1		1	1	2	395	426
OTHER																													0
SUB-TOTAL	8	6	5	0	16	17	15	19	20	15	14	30	58	45	4	6	0	11	7	21	10	9	15	0	12	4	15	791	1173
TOTAL	50	32	34	21	140	168	103	219	113	130	124	270	669	942	43	22	7	50	33	308	496	45	220	22	51	20	60	3354	7746

COMMUNITIES
1-ARCTIC RED RIVER
2-COLVILLE LAKE
3-DETAH
4-ENTERPRISE
5-FORT FRANKLIN
6-FORT GOOD HOPE
7-FORT LIARD
8-FORT MCPHERSON
9-FORT NORMAN
10-FORT PROVIDENCE
11-FORT RESOLUTION
12-FORT SIMPSON
13-FORT SMITH
14-HAY RIVER
15-HAY RIVER VILLAGE
16-JEAN-MARIE RIVER
17-KAKISA
18-LAC LA MARTRE
19-NAHANNI BUTTE
20-NORMAN WELLS
21-PINE POINT
22-RAE LAKES
23-RAE-EDZO
24-SNARE LAKES
25-SNOWDRIFT
26-TROUT LAKE
27-WRIGLEY
28-YELLOWKNIFE

* - ASSUMED RESIDENTIAL, COMMERCIAL AND COMMUNITY USES TO BE .5, .25 & .25 OF YK ASSESSMENT ROLE ENTRIES (EX NWTHC)
** - SOURCE: DIEUS 82/83 DATA
*** - DATA ACQUIRED BY PERSONAL COMMUNITCATION

TABLE 6 - FUEL OIL PROJECTIONS FOR ALL COMMUNITIES

	DIEUS ESTIMATED AMOUNTS FUEL-OIL (LITRES)	FUEL OIL W/C SCENARIO 1985	1995	2005	FUEL OIL C/E SCENARIO 1985	1995	2005	FUEL OIL MAX CONS. 1985	1995	2005
ARCTIC RED RIVER	149,559	156351	184,577	206,739	117263	138,433	155,054	51596	60910	68224
COLVILLE LAKE	4,909	5132	6,058	6,786	3849	4,544	5,089	1694	1999	2239
BETAH	232,287	242836	286,675	321,095	182127	215,006	240,822	80136	94603	105961
ENTERPRISE	79,550	83163	98,176	109,964	62372	73,632	82,473	27444	32398	36288
FORT FRANKLIN	1,163,120	1215941	1,435,455	1,607,806	911956	1,076,591	1,205,855	401261	473700	530576
FORT GOOD HOPE	1,008,955	1054775	1,245,194	1,394,700	791081	933,895	1,046,025	348076	410914	460251
FORT LIARD	730,157	763316	901,117	1,009,312	572487	675,838	756,984	251894	297369	333073
FORT MCPHERSON	1,290,954	1349581	1,593,221	1,784,514	1012186	1,194,915	1,338,385	445362	525763	588890
FORT NORMAN	1,392,724	1455973	1,718,819	1,925,193	1091979	1,289,114	1,443,894	480471	567210	635314
FORT PROVIDENCE	7,000,000	7317895	8,638,994	9,676,252	5488421	6,479,245	7,257,189	2414905	2850868	3193163
FORT RESOLUTION	1,033,300	1080226	1,275,239	1,428,353	810169	956,429	1,071,265	356475	420829	471357
FORT SIMPSON	1,227,444	1283187	1,514,840	1,696,723	962390	1,136,130	1,272,542	423452	499897	559918
FORT SMITH	5,000,000	5227068	6,170,710	6,911,609	3920301	4,628,032	5,183,706	1724932	2036334	2280831
HAY RIVER	8,907,922	9312463	10,993,640	12,313,614	6984347	8,245,230	9,235,211	3073113	3627901	4063493
HAY RIVER VILLAGE	30,000	31362	37,024	41,470	23522	27,768	31,102	10350	12218	13685
JEAN-MARIE RIVER	84,626	90560	106,909	119,745	67920	80,182	89,809	29885	35280	39516
KAKISA	0	0	0	0	0	0	0	0	0	0
LAC LA MARTRE	507,078	530106	625,806	700,945	397580	469,355	525,709	174935	206516	231312
MAHANNI BUTTE	147,625	154329	182,190	204,065	115747	136,643	153,049	50929	60123	67342
NORMAN WELLS	0	0	0	0	0	0	0	0	0	0
PINE POINT	3,223,100	3369473	3,977,763	4,455,361	2527104	2,983,322	3,341,521	1111926	1312662	1470269
RAE LAKES	215,775	225574	266,297	298,270	169181	199,723	223,703	74439	87878	98429
RAE-EDZO	3,149,908	3292957	3,887,434	4,354,186	2469717	2,915,575	3,265,640	1086676	1282853	1436881
SNARE LAKES	0	0	0	0	0	0	0	0	0	0
SNOWDRIFT	672,896	703455	830,449	930,159	527591	622,837	697,619	232140	274048	306952
TROUT LAKE	41,000	42862	50,600	56,675	32146	37,950	42,506	14144	16698	18703
WRIGLEY	476,271	497900	587,786	658,360	373425	440,840	493,770	164307	193969	217259
YELLOWKNIFE	36,368,717	38020351	44,884,160	50,273,268	28515264	33,663,121	37,704,951	12546716	14811773	16590179
TOTAL	74,139,877	77506836	91,499,134	102,485,163	58130127	68,624,351	76,863,872	25577235	30194714	33820104

TABLE 7 - WOOD PROJECTIONS FOR ALL COMMUNITIES

	DIEUS-ESTIMATED AMOUNTS WOOD (CORDS)	WOOD W/C SCENARIO 1985	1995	2005	WOOD C/E SCENARIO 1985	1995	2005	WOOD MAX CONS.SCENARIO 1985	1995	2005
ARCTIC RED RIVER	530	554	654	733	416	491	549	183	216	242
COLVILLE LAKE	370	387	457	511	290	342	384	128	151	169
BETAH	252	263	311	348	198	233	261	87	103	115
ENTERPRISE	40	50	59	66	38	44	50	17	20	22
FORT FRANKLIN	1410	1474	1,740	1,949	1106	1,305	1,462	486	574	643
FORT GOOD HOPE	1690	1767	2,086	2,336	1325	1,564	1,752	583	688	771
FORT LIARD	756	790	933	1,045	593	700	784	261	308	345
FORT MCPHERSON	2220	2321	2,740	3,069	1741	2,055	2,302	766	904	1013
FORT NORMAN	1290	1349	1,592	1,783	1011	1,194	1,337	445	525	588
FORT PROVIDENCE	96	100	118	133	75	89	100	33	39	44
FORT RESOLUTION	456	477	563	630	358	422	473	157	186	208
FORT SIMPSON	516	539	637	713	405	478	535	178	210	235
FORT SMITH	2436	2547	3,006	3,367	1910	2,255	2,526	840	992	1111
HAY RIVER	9370	9796	11,564	12,952	7347	8,673	9,714	3233	3816	4274
HAY RIVER VILLAGE	444	464	548	614	348	411	460	153	181	203
JEAN-MARIE RIVER	192	201	237	265	151	178	199	66	78	88
KAKISA	84	88	104	116	66	78	87	29	34	38
LAC LA MARTRE	372	389	459	514	292	344	386	128	152	170
MAHANNI BUTTE	144	151	178	199	113	133	149	50	59	66
NORMAN WELLS	3110	3251	3,838	4,299	2438	2,879	3,224	1073	1267	1419
PINE POINT	0	0	0	0	0	0	0	0	0	0
RAE LAKES	444	464	548	614	348	411	460	153	181	203
RAE-EDZO	132	138	163	182	103	122	137	46	54	60
SNARE LAKES	200	209	247	276	157	185	207	69	81	91
SNOWDRIFT	240	251	296	332	188	222	249	83	98	109
TROUT LAKE	228	238	281	315	179	211	236	79	93	104
WRIGLEY	324	339	400	448	254	300	336	112	132	148
YELLOWKNIFE	3080	3220	3,801	4,258	2415	2,851	3,193	1063	1254	1405
TOTAL	30434	31816	37,560	42,070	23862	28,170	31,552	10499	12395	13883

TABLE 8 - PROPANE PROJECTIONS FOR ALL COMMUNITIES

	BIEUS-ESTIMATED AMOUNTS									
	PROPANE (LITRES)	PROPANE W/C SCENARIO			PROPANE C/E SCENARIO			PROPANE MAX CONS. SCENARIO		
		1985	1995	2005	1985	1995	2005	1985	1995	2005
ARCTIC RED RIVER	0	0	0	0	0	0	0	0	0	0
COLVILLE LAKE	0	0	0	0	0	0	0	0	0	0
DETAH	0	0	0	0	0	0	0	0	0	0
ENTERPRISE	43,478	45452	53,658	60,101	34089	40,244	45,075	14999	17707	19833
FORT FRANKLIN	0	0	0	0	0	0	0	0	0	0
FORT GOOD HOPE	0	0	0	0	0	0	0	0	0	0
FORT LIARD	0	0	0	0	0	0	0	0	0	0
FORT MCPHERSON	0	0	0	0	0	0	0	0	0	0
FORT NORMAN	0	0	0	0	0	0	0	0	0	0
FORT PROVIDENCE	10,870	11364	13,415	15,026	8523	10,061	11,269	3750	4427	4959
FORT RESOLUTION	27,174	28408	33,537	37,563	21306	25,152	28,172	9375	11067	12396
FORT SIMPSON	119,565	124995	147,560	165,277	93746	110,670	123,958	41248	48695	54542
FORT SMITH	86,956	90905	107,316	120,201	68179	80,487	90,151	29999	35414	39666
HAY RIVER	7,121,900	7445331	8,789,436	9,844,757	5583998	6,592,077	7,383,568	2456959	2900514	3248770
HAY RIVER VILLAGE	0	0	0	0	0	0	0	0	0	0
JEAN-MARIE RIVER	5,435	5682	6,708	7,513	4261	5,031	5,635	1875	2213	2479
KAKISA	0	0	0	0	0	0	0	0	0	0
LAC LA MARTRE	0	0	0	0	0	0	0	0	0	0
MAHANNI BUTTE	0	0	0	0	0	0	0	0	0	0
NORMAN WELLS	0	0	0	0	0	0	0	0	0	0
PINE POINT	43,478	45452	53,658	60,101	34089	40,244	45,075	14999	17707	19833
RAE LAKES	0	0	0	0	0	0	0	0	0	0
RAE-EDZO	38,043	39771	46,950	52,588	29828	35,213	39,441	13124	15494	17354
SNARE LAKES	500	523	617	691	392	463	518	172	204	228
SNOWDRIFT	0	0	0	0	0	0	0	0	0	0
TROUT LAKE	0	0	0	0	0	0	0	0	0	0
WRIGLEY	0	0	0	0	0	0	0	0	0	0
YELLOWKNIFE	1,000,000	1045414	1,234,142	1,382,322	784060	925,606	1,036,741	344986	407267	456166
TOTAL	8,497,399	8883296	10,486,997	11,746,139	6662472	7,865,248	8,809,604	2931488	3460709	3876226

TABLE 9 - BIOMASS ENERGY EQUIVALENT BY COMMUNITY & OWNERSHIP

COMMUNITY	VOLUME OF FUEL OIL IN LITRES	BTEUS WOOD IN CORDS	PROPANE IN LITRES	NUMBER OF UNITS BY OWNERSHIP MUNIC	TERR.	FED	CROWN	COMMUNITY	INDUST	COMMERC	PRIVATE	TOTAL	TOTAL ENERGY IN GIGAJOULES***	BIOMASS EQUIVALENCY AMOUNTS (IN CORDS) BY OWNERSHIP - @ MUNIC	TERR.	FED	CROWN	COMMUNITY	INDUST	COMMERC	PRIVATE	TOTAL
ARCTIC RED RIVER	149,559	530	0	18	13	1	4	0	0	5	9	50	13735	307	222	17	68	0	0	85	153	852
COLVILLE LAKE	4,909	370	0	0	0	1	1	0	0	13	18	33	6132	0	0	12	12	0	0	150	208	381
BETAH	232,287	252	0	0	7	1	0	2	0	1	23	34	12129	0	155	22	0	44	0	22	509	753
ENTERPRISE	79,550	48	43,478	0	1	0	0	0	0	4	16	21	4534	0	13	0	0	0	0	54	214	281
FORT FRANKLIN	1,163,120	1,410	0	67	22	1	11	1	0	16	22	140	63119	1875	616	28	308	28	0	448	616	3,917
FORT GOOD HOPE	1,008,955	1,690	0	27	34	6	12	2	0	15	72	168	62276	621	782	138	276	46	0	345	1656	3,865
FORT LIARD	730,157	756	0	14	8	13	0	4	0	5	59	103	37543	317	181	294	0	99	0	113	1335	2,330
FORT MCPHERSON	1,290,954	2,220	0	62	42	6	9	6	0	12	82	219	80611	1416	939	137	206	137	0	274	1873	5,083
FORT NORMAN	1,392,724	1,290	0	41	23	5	6	3	0	10	25	113	69161	1557	874	190	228	114	0	380	950	4,292
FORT PROVIDENCE	700,000	96	10,870	96	11	4	0	6	0	5	10	130	26110	1172	137	50	0	75	0	62	125	1,620
FORT RESOLUTION	1,033,300	456	27,174	43	3	9	0	6	0	4	59	124	43862	944	66	198	0	132	0	88	1295	2,722
FORT SIMPSON	1,227,444	516	119,565	33	10	43	0	8	0	30	138	270	53491	407	222	531	0	99	0	370	1703	3,332
FORT SMITH	5,000,000	2,436	86,956	2	99	81	1	18	1	20	447	669	214917	40	1974	1615	20	359	20	399	8912	13,338
HAY RIVER	8,907,922	9,370	7,121,900	42	42	68	96	13	0	208	453	942	623721	1726	2548	2794	3945	534	0	8547	18615	38,710
HAY RIVER VILLAGE	30,000	444	0	0	0	0	0	43	0	0	0	43	8196	0	0	0	0	509	0	0	0	509
JEAN-MARIE RIVER	86,626	192	5,435	0	2	2	0	3	0	0	15	22	6227	0	35	35	0	53	0	0	264	386
KAKISA	100	84	0	0	0	0	0	0	0	0	7	7	1357	0	0	0	0	0	0	0	84	84
LAC LA MARTRE	507,078	372	0	4	3	7	0	3	0	2	31	50	23607	117	88	205	0	88	0	59	908	1,465
WAHANNI BUTTE	147,625	144	0	0	6	0	1	1	0	4	21	33	7948	0	84	0	14	14	0	56	294	462
NORMAN WELLS	100	3,110	0	16	27	47	13	4	0	174	27	308	50114	162	273	475	131	90	0	1757	273	3,110
PINE POINT	3,223,100	0	43,478	34	2	6	0	11	431	4	8	496	112949	481	28	85	0	155	4,091	57	113	7,010
RAE LAKES	215,775	444	0	0	2	3	0	4	0	0	36	45	14649	0	40	61	0	81	0	0	727	909
RAE-EDZO	2,078,715	132	38,043	28	130	8	0	6	0	5	43	220	75202	594	2758	170	0	127	0	106	912	4,667
SNARE LAKES	100	200	500	0	2	0	0	0	0	2	17	21	3238	0	19	0	0	0	0	19	163	201
SNOWDRIFT	672,896	240	0	20	8	3	0	3	0	2	15	51	27240	663	265	99	0	99	0	66	497	1,691
TROUT LAKE	41,000	228	0	0	2	0	0	2	0	0	16	20	5098	0	32	0	0	32	0	0	253	316
WRIGLEY	476,271	324	0	6	10	5	2	4	0	1	32	60	21764	135	225	113	45	90	0	23	720	1,351
YELLOWKNIFE	36,368,717	3,080	1,000,000	179	484	586	18	86	99	397	1585	3354	1335804	4424	9984	14485	445	2,126	2,447	9813	39178	82,903
TOTAL	66,768,984	30,434	8,497,399	730	941	906	174	239	531	939	3286	7746	3004432	16958	22582	21752	5697	5,072	8,558	23292	82551	186,462

ASSUMES: 116600 BTU/GALLON OF FUEL OIL OR 36646.8 BTU/LITRE &
110000 BTU/ GALLON OF PROPANE OR 24196.4 BTU/LITRE &
17000000 BTU/CORD OF WOOD.

0 - ASSUMES HALF OF ENERGY REQUIREMENT MET BY WOOD

00 - ASSUMES CONSTANT BURNING EFFICIENCY RATE ACROSS FUELS

@ - ASSUMES ALL UNITS BURN AN EQUAL SHARE OF COMMUNITY FUEL

000 - BTU's/1,055,060 = gigajoule(s)

TABLE 10 - BIOMASS ENERGY EQUIVALENT BY COMMUNITY & USE

COMMUNITY	# BUILD'GS	VOLUME OF FUEL OIL IN LITRES	BTEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES***	FULL CONVERSION TO BIOMASS
ARCTIC RED RIVER						
RESIDENTIAL	30	89,735	318	0	8241	511
COMMERCIAL	12	35,894	127	0	3296	205
COMMUNITY	8	23,929	85	0	2198	136
TOTAL	50	149,559	530	0	13735	852
COLVILLE LAKE						
RESIDENTIAL	25	3,835	289	0	4791	297
COMMERCIAL	1	153	12	0	192	12
COMMUNITY	6	920	69	0	1150	71
TOTAL	32	4,909	370	0	6132	381
DETAH						
RESIDENTIAL	28	191,295	208	0	9988	620
COMMERCIAL	1	6,832	7	0	357	22
COMMUNITY	5	34,160	37	0	1784	111
TOTAL	34	232,287	252	0	12129	753
ENTERPRISE						
RESIDENTIAL	17	64,398	39	35,196	3470	228
COMMERCIAL	4	15,152	9	8,282	864	54
COMMUNITY	0	0	0	0	0	0
TOTAL	21	79,550	48	43,478	4534	281
FORT FRANKLIN						
RESIDENTIAL	108	115,374	409	0	10595	658
COMMERCIAL	16	17,092	61	0	1570	97
COMMUNITY	16	17,092	61	0	1570	97
TOTAL	140	149,559	530	0	13735	852
FORT GOOD HOPE						
RESIDENTIAL	131	3,828	289	0	4782	297
COMMERCIAL	20	584	44	0	730	45
COMMUNITY	17	497	37	0	621	39
TOTAL	168	4,909	370	0	6132	381
FORT LIARD						
RESIDENTIAL	84	189,438	266	0	9091	614
COMMERCIAL	4	9,021	10	0	471	29
COMMUNITY	15	33,828	37	0	1766	110
TOTAL	103	232,287	252	0	12129	753
FORT MCPHERSON						
RESIDENTIAL	145	59,935	36	32,757	3416	212
COMMERCIAL	35	12,713	8	6,949	725	45
COMMUNITY	19	6,902	4	3,772	393	24
TOTAL	219	79,550	48	43,478	4534	281

TABLE 11 - BIOMASS ENERGY EQUIVALENT BY COMMUNITY & USE

COMMUNITY	# BUILD'GS	VOLUME OF FUEL OIL IN LITRES	BTEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES	FULL CONVERSION TO BIOMASS
FORT NORMAN						
RESIDENTIAL	89	1,096,924	1,016	0	54472	3381
COMMERCIAL	4	49,300	46	0	2448	152
COMMUNITY	20	246,500	228	0	12241	760
TOTAL	113	1,392,724	1,290	0	69161	4292
FORT PROVIDENCE						
RESIDENTIAL	107	576,154	79	8,947	21491	1334
COMMERCIAL	8	43,077	6	669	1607	100
COMMUNITY	15	80,769	11	1,254	3013	187
TOTAL	130	700,000	96	10,870	26110	1620
FORT RESOLUTION						
RESIDENTIAL	102	849,973	375	22,353	36080	2239
COMMERCIAL	8	66,665	29	1,753	2830	176
COMMUNITY	14	116,663	51	3,068	4952	307
TOTAL	124	1,033,300	456	27,174	43862	2722
FORT SIMPSON						
RESIDENTIAL	212	963,771	405	93,881	42157	2616
COMMERCIAL	28	127,290	54	12,399	5568	346
COMMUNITY	30	136,383	57	13,285	5966	370
TOTAL	270	1,227,444	516	119,565	53691	3332
FORT SMITH						
RESIDENTIAL	577	4,312,607	2,101	74,998	185362	11504
COMMERCIAL	34	254,111	124	4,419	10923	678
COMMUNITY	58	433,483	211	7,539	18633	1156
TOTAL	669	5,000,000	2,436	86,956	214917	13338
HAY RIVER						
RESIDENTIAL	795	7,517,832	7,908	6,010,521	526388	32669
COMMERCIAL	102	964,552	1,015	771,161	67537	4191
COMMUNITY	45	425,530	448	340,218	29796	1849
TOTAL	942	8,907,922	9,370	7,121,900	623721	38710
HAY RIVER VILLAGE						
RESIDENTIAL	38	26,512	392	0	7243	450
COMMERCIAL	1	698	10	0	191	12
COMMUNITY	4	2,791	41	0	762	47
TOTAL	43	30,000	444	0	8196	509
JEAN-MARIE RIVER						
RESIDENTIAL	15	59,063	131	3,706	4246	264
COMMERCIAL	1	3,938	9	247	283	18
COMMUNITY	6	23,625	52	1,482	1698	105
TOTAL	22	86,626	192	5,435	6227	386

TABLE 12 - BIOMASS ENERGY EQUIVALENT BY COMMUNITY & USE

COMMUNITY	# BUILD'GS	VOLUME OF FUEL OIL IN LITRES	DIEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES	FULL CONVERSION TO BIOMASS
KAKISA						
RESIDENTIAL	7	100	84	0	1357	84
COMMERCIAL	0	0	0	0	0	0
COMMUNITY	0	0	0	0	0	0
TOTAL	7	100	84	0	1357	84
LAC LA MARTRE						
RESIDENTIAL	37	375,238	275	0	17469	1084
COMMERCIAL	2	20,283	15	0	944	59
COMMUNITY	11	111,557	82	0	5194	322
TOTAL	50	507,078	372	0	23607	1465
NAHANNI BUTTE						
RESIDENTIAL	22	98,417	96	0	4965	308
COMMERCIAL	4	17,894	17	0	903	56
COMMUNITY	7	31,314	31	0	1580	98
TOTAL	33	147,625	144	0	7448	462
NORMAN WELLS						
RESIDENTIAL	204	66	2,060	0	33193	2060
COMMERCIAL	83	27	838	0	13505	838
COMMUNITY	21	7	212	0	3417	212
TOTAL	308	100	3,110	0	50114	3110
PINE POINT						
RESIDENTIAL	478	3,106,133	0	41,900	108850	6756
COMMERCIAL	8	51,985	0	701	1822	113
COMMUNITY	10	64,982	0	877	2277	141
TOTAL	496	3,223,100	0	43,478	112949	7010
RAE LAKES						
RESIDENTIAL	35	167,825	345	0	11394	707
COMMERCIAL	1	4,795	10	0	326	20
COMMUNITY	9	43,155	89	0	2930	182
TOTAL	45	215,775	444	0	14649	909
RAE-EDZO						
RESIDENTIAL	199	1,880,292	119	34,412	68024	4222
COMMERCIAL	6	56,692	4	1,030	2051	127
COMMUNITY	15	141,731	9	2,594	5127	318
TOTAL	220	2,078,715	132	38,043	75202	4667
SNARE LAKES						
RESIDENTIAL	21	95	191	477	3090	192
COMMERCIAL	1	5	9	23	147	9
COMMUNITY	0	0	0	0	0	0
TOTAL	22	100	200	500	3238	201

TABLE 13 - BIOMASS ENERGY EQUIVALENT BY COMMUNITY & USE

COMMUNITY	# BUILD'GS	VOLUME OF FUEL OIL IN LITRES	DIEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES	FULL CONVERSION TO BIOMASS
SNOWDRIFT						
RESIDENTIAL	37	488,179	174	0	19762	1226
COMMERCIAL	2	26,388	9	0	1068	66
COMMUNITY	12	158,329	56	0	6409	398
TOTAL	51	672,896	240	0	27240	1691
TROUT LAKE						
RESIDENTIAL	16	32,000	182	0	4078	253
COMMERCIAL	0	0	0	0	0	0
COMMUNITY	4	9,200	46	0	1020	63
TOTAL	20	41,000	228	0	5098	316
WRIGLEY						
RESIDENTIAL	43	341,328	232	0	15597	968
COMMERCIAL	2	15,876	11	0	725	45
COMMUNITY	15	119,068	81	0	5441	338
TOTAL	60	476,271	324	0	21764	1351
YELLOWKNIFE						
RESIDENTIAL	1676	18,173,515	1,539	499,702	667504	41427
COMMERCIAL	839	9,097,601	770	250,149	334150	20738
COMMUNITY	839	9,097,601	770	250,149	334150	20738
TOTAL	3354	36,368,717	3,080	1,000,000	1335804	82903

TABLE 14 - ALL FUELS BIOMASS ENERGY EQUIVALENT BY COMMUNITY

COMMUNITY	VOLUME OF FUEL OIL IN LITRES	BIEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES***	FULL CONVERSION TO BIOMASS	PARTIAL CONVERSION TO BIOMASS	CURRENT BIOMASS USE
ARCTIC RED RIVER	149,559	530	0	13,735	852	426	530
COLVILLE LAKE	4,909	370	0	6,132	381	190	370
DETAH	232,287	252	0	12,129	753	376	252
ENTERPRISE	79,550	48	43,478	4,534	281	141	48
FORT FRANKLIN	1,163,120	1,410	0	63,119	3,917	1,959	1,410
FORT GOOD HOPE	1,008,955	1,690	0	62,276	3,865	1,932	1,690
FORT LIARD	730,157	756	0	37,543	2,330	1,165	756
FORT MCPHERSON	1,290,954	2,220	0	80,611	5,003	2,501	2,220
FORT NORMAN	1,392,724	1,290	0	69,161	4,292	2,146	1,290
FORT PROVIDENCE	700,000	96	10,870	26,110	1,620	810	96
FORT RESOLUTION	1,033,300	456	27,174	43,862	2,722	1,361	456
FORT SIMPSON	1,227,444	516	119,565	53,691	3,332	1,666	516
FORT SMITH	5,000,000	2,436	86,956	214,917	13,338	6,669	2,436
HAY RIVER	8,907,922	9,370	7,121,900	623,721	38,710	19,355	9,370
HAY RIVER VILLAGE	30,000	444	0	8,196	509	254	444
JEAN-MARIE RIVER	86,626	192	5,435	6,227	386	193	192
KAKISA	100	84	0	1,357	84	42	84
LAC LA MARTRE	507,078	372	0	23,607	1,465	733	372
WAHANNI BUTTE	147,625	144	0	7,448	462	231	144
NORMAN WELLS	100	100	0	1,615	100	50	0
PINE POINT	3,223,100	0	43,478	112,949	7,010	3,505	0
RAE LAKES	215,775	444	0	14,649	909	455	444
RAE-EDZO	2,078,715	132	38,043	75,202	4,667	2,334	132
SNARE LAKES	100	200	500	3,238	201	100	200
SNOWDRIFT	672,896	240	0	27,240	1,691	845	240
TROUT LAKE	41,000	228	0	5,098	316	158	228
WRIGLEY	476,271	324	0	21,764	1,351	675	324
YELLOWKNIFE	36,368,717	3,080	1,000,000	1,335,804	82,903	41,452	3,080
TOTAL	66,768,984	27,424	8,497,399	2,953,932	183,452	91,726	27,324

ASSUMES:116600 BTU/GALLON OF FUEL OIL OR 36646.8 BTU/LITRE &
110000 BTU/ GALLON OF PROPANE OR 24196.6 BTU/LITRE &
17000000 BTU/CORD OF WOOD.

* - ASSUMES HALF OF ENERGY REQUIREMENT MET BY WOOD

** - ASSUMES CONSTANT BURNING EFFICIENCY RATE ACROSS FUELS

*** - BTU's/1,055,060 = gigajoule(s)

TABLE 15 - VALUE OF DISPLACED FOSSIL FUEL

COMMUNITY	VOLUME OF FUEL OIL IN LITRES	ESTIMATED $VALUE @ $.41/l.	PROPANE IN LITRES	ESTIMATED $VALUE @ $.30/l.	$VALUE FOSSIL FUELS	ESTIMATED CORDAGES REQUIRED	ESTIMATED $VALUE @ $80/cord	ESTIMATED $SAVINGS OF WOOD OVER OIL
ARCTIC RED RIVER	149,559	61,319	0	0	61,319	322	25,792	35,527
COLVILLE LAKE	4,909	2,013	0	0	2,013	11	847	1,166
DETAH	232,287	95,238	0	0	95,238	501	40,059	55,178
ENTERPRISE	79,550	32,616	43,478	13,043	45,659	233	18,670	26,989
FORT FRANKLIN	1,163,120	476,879	0	0	476,879	2,507	200,586	276,293
FORT GOOD HOPE	1,008,955	413,672	0	0	413,672	2,175	174,000	239,672
FORT LIARD	730,157	299,364	0	0	299,364	1,574	125,920	173,445
FORT MCPHERSON	1,290,954	529,291	0	0	529,291	2,783	222,632	306,659
FORT NORMAN	1,392,724	571,017	0	0	571,017	3,002	240,183	330,834
FORT PROVIDENCE	700,000	287,000	10,870	3,261	290,261	1,524	121,957	168,304
FORT RESOLUTION	1,033,300	423,653	27,174	8,152	431,805	2,266	181,293	250,513
FORT SIMPSON	1,227,444	503,252	119,565	35,870	539,122	2,816	225,294	313,828
FORT SMITH	5,000,000	2,050,000	86,956	26,087	2,076,087	10,902	872,179	1,203,908
HAY RIVER	8,907,922	3,652,248	7,121,900	2,136,570	5,788,818	29,340	2,347,165	3,441,653
HAY RIVER VILLAGE	30,000	12,300	0	0	12,300	65	5,174	7,126
JEAN-MARIE RIVER	86,626	35,517	5,435	1,631	37,147	194	15,558	21,589
KAKISA	100	41	0	0	41	0	17	24
LAC LA MARTRE	507,078	207,902	0	0	207,902	1,093	87,448	120,454
MAHANNI BUTTE	147,625	60,526	0	0	60,526	318	25,459	35,068
NORMAN WELLS	100	41	0	0	41	0	17	24
PINE POINT	3,223,100	1,321,471	43,478	13,043	1,334,514	7,010	560,792	773,722
RAE LAKES	215,775	88,468	0	0	88,468	465	37,212	51,256
RAE-EDZO	2,078,715	852,273	38,043	11,413	863,686	4,535	362,818	500,868
SNARE LAKES	100	41	500	150	191	1	74	117
SNOWDRIFT	672,896	275,887	0	0	275,887	1,451	116,045	159,843
TROUT LAKE	41,000	16,810	0	0	16,810	88	7,071	9,739
WRIGLEY	476,271	195,271	0	0	195,271	1,027	82,136	113,136
YELLOWKNIFE	36,368,717	14,911,174	1,000,000	300,000	15,211,174	79,823	6,385,853	8,825,321
TOTAL	66,768,984	27,375,283	8,497,399	2,549,220	29,924,503	156,028	12,482,248	17,442,255

ASSUMES: 116600 BTU/GALLON OF FUEL OIL OR 36646.8 BTU/LITRE &
110000 BTU/ GALLON OF PROPANE OR 24196.6 BTU/LITRE &
17000000 BTU/CORD OF WOOD.

** - ASSUMES CONSTANT BURNING EFFICIENCY RATE ACROSS FUELS

TABLE 16 - COST OF CONVERSION TO WOOD FUEL

COMMUNITY	NUMBER OF BUILDINGS	$$ $COST TO PURCHASE NEW AND INSTALL WOOD-BURNING SYSTEM	FREIGHT$/ UNIT	TOTAL$ FREIGHT	TOTAL ESTIMATED COST
ARCTIC RED RIVER	53	80,083	100	5,300	85,383
COLVILLE LAKE	37	55,907	150	5,550	61,457
DETAH	35	52,885	0	0	52,885
ENTERPRISE	23	34,753	0	0	34,753
FORT FRANKLIN	141	213,051	100	14,100	227,151
FORT GOOD HOPE	169	255,359	100	16,900	272,259
FORT LIARD	108	163,188	100	10,800	173,988
FORT MCPHERSON	222	335,442	100	22,200	357,642
FORT NORMAN	129	194,919	100	12,900	207,819
FORT PROVIDENCE	132	199,452	0	0	199,452
FORT RESOLUTION	126	190,386	0	0	190,386
FORT SIMPSON	274	414,014	0	0	414,014
FORT SMITH	689	1,041,079	0	0	1,041,079
HAY RIVER	936	1,414,296	0	0	1,414,296
HAY RIVER VILLAGE	43	64,973	0	0	64,973
JEAN-MARIE RIVER	22	33,242	100	2,200	35,442
KAKISA	7	10,577	0	0	10,577
LAC LA MARTRE	50	75,550	100	5,000	80,550
MAHANNI BUTTE	34	51,374	150	5,100	56,474
NORMAN WELLS	311	469,921	100	31,100	501,021
PINE POINT	498	752,478	0	0	752,478
RAE LAKES	45	67,995	100	4,500	72,495
RAE-EDZO	200	314,288	0	0	314,288
SNARE LAKES	22	33,242	100	2,200	35,442
SNOWDRIFT	55	83,105	100	5,500	88,605
TROUT LAKE	20	30,220	150	3,000	33,220
WRIGLEY	61	92,171	100	6,100	98,271
YELLOWKNIFE	3000	4,533,000	0	0	4,533,000
TOTAL		11,256,950	1,750	152,450	11,409,400

$ - SOURCE: BASED ON YELLOWKNIFE PRICES - WOODSTOVE SHOP - GARTH HALLBRIDGE - FEB,19,1985
$$ - AVERAGE PURCHASE AND INSTALLATION = $1511

TABLE 17 - BIOMASS AREAS & DISTANCES BY COMMUNITY

$SEE ASSUMPTIONS BELOW

COMMUNITY	NUMBER OF BUILDINGS	TOTAL CORDS	TOTAL $VALUE	FOREST YIELD CDS./ACRE	ACRES PER YEAR	LIFECYCLE ACRES	LIFECYCLE SQ.MILES	RADIUS MILES
DIEVS'83								
AKLAVIK	248	2480	198400.00	5.00	496.00	62000	97	5.55
INUVIK	750	7500	600000.00	.98	7653.06	956633	1495	21.81
FT.MCPHERSON	222	2220	177600.00	1.00	2220.00	277500	434	11.75
ARCTIC RED	53	530	42400.00	1.22	434.43	54303	85	5.20
COLVILLE LAKE	37	370	29600.00	.75	493.33	61667	96	5.54
FT.GOOD HOPE	169	1690	135200.00	2.54	665.35	83169	130	6.43
NORMAN WELLS	311	3110	248800.00	2.51	1239.04	154880	242	8.78
FT.FRANKLIN	141	1410	112800.00	2.85	494.74	61842	97	5.55
FT.NORMAN	129	1290	103200.00	3.58	360.57	46071	72	4.79
HAY RIVER	937	9370	749600.00	15.65	598.72	74840	117	6.10
SUB-TOTAL	2997	29970	2397600.00		14663.25	1832906	2864	
DIEVS'82								
DETAH	35	350	28000.00	6.20	56.45	7056	11	1.87
EDZO	76	760	60800.00	8.53	89.10	11137	17	2.35
ENTERPRISE	23	230	18400.00	15.65	14.70	1837	3	.96
FORT LIARD	108	1080	86400.00	40.00	27.00	3375	5	1.30
FORT PROVIDENCE	132	1320	105600.00	35.50	37.18	4648	7	1.52
FORT RAE	153	1530	122400.00	8.53	179.37	22421	35	3.34
FORT RESOLUTION	126	1260	100800.00	35.00	36.00	4500	7	1.50
FORT SIMPSON	272	2720	217600.00	39.00	69.74	8718	14	2.08
FORT SMITH	687	6870	549600.00	16.00	429.38	53672	84	5.17
HAY RIVER VILLAGE	43	430	34400.00	15.65	27.48	3435	5	1.31
JEAN MARIE RIVER	22	220	17600.00	39.50	5.57	696	1	.59
KAKISA	7	70	5600.00	32.50	2.15	269	0	.37
LAC LA MARTRE	50	500	40000.00	10.25	48.78	6098	10	1.74
MAHANNI BUTTE	34	340	27200.00	22.00	15.45	1932	3	.98
PINE POINT	498	4980	398400.00	15.00	332.00	41500	65	4.54
RAE LAKES	45	450	36000.00	7.75	58.06	7258	11	1.90
SNOWDRIFT	55	550	44000.00	33.50	16.42	2052	3	1.01
TROUT LAKE	20	200	16000.00	27.00	7.41	926	1	.68
WRIGLEY	61	610	48800.00	11.60	52.59	6573	10	1.81
SUB-TOTAL	2447	24470	1957600.00		1504.82	188103		
TOTAL	5444	54440	4355200.00		16168.07	2021009		

ASSUMPTIONS:
ANN.CONSUMP'N PER BUILDING= 10
RETAIL $ VALUE PER CORD= 80
FOREST LIFECYCLE YEARS= 125
ONE SQ.MILE= 640 ACRES

TABLE 16 - EMPLOYMENT WITH BIOMASS FUELS BY COMMUNITY

COMMUNITY	VOLUME OF FUEL OIL IN LITRES	DIEUS WOOD IN CORDS	PROPANE IN LITRES	TOTAL ENERGY IN GIGAJOULES	CORDS AT FULL CONVERSION TO BIOMASS	CORDS AT PARTIAL * CONVERSION TO BIOMASS	CORDS AT CURRENT BIOMASS USE	BIOMASS HARVEST JOBS FULL CONV MAN-DAYS	BIOMASS HARVEST JOBS PART CON MAN-DAYS	BIOMASS HARVEST JOBS CURRENT MAN-DAYS	** TOTAL JOBS FULL CONV MAN-DAYS	** TOTAL JOBS PART CON MAN-DAYS	** TOTAL JOBS CURRENT MAN-DAYS
ARCTIC RED RIVER	149,559	530	0	17135	852	426	530	284	142	177	994	497	618
COLVILLE LAKE	4,969	370	0	6132	381	190	370	127	63	123	444	222	432
DETAH	232,287	252	0	12129	753	376	252	251	125	84	878	439	294
ENTERPRISE	79,550	48	43,478	4534	281	141	48	94	47	16	328	164	56
FORT FRANKLIN	1,163,128	1,410	0	63119	3917	1959	1410	1306	653	470	4,570	2,285	1,645
FORT GOOD HOPE	1,008,955	1,690	0	62276	3865	1932	1690	1288	644	563	4,509	2,255	1,972
FORT LIARD	730,157	756	0	37543	2330	1165	756	777	388	252	2,718	1,359	882
FORT MCPHERSON	1,290,954	2,220	0	80611	5003	2501	2220	1668	834	740	5,837	2,918	2,590
FORT NORMAN	1,392,724	1,290	0	69161	4292	2146	1290	1431	715	430	5,008	2,504	1,505
FORT PROVIDENCE	700,000	96	10,870	26110	1620	810	96	540	270	32	1,891	945	112
FORT RESOLUTION	1,033,300	456	27,174	43862	2722	1361	456	907	454	152	3,176	1,588	532
FORT SIMPSON	1,227,444	516	119,565	53691	3332	1666	516	1111	555	172	3,888	1,944	602
FORT SMITH	5,000,000	2,436	86,956	214917	13338	6669	2436	4446	2223	812	15,561	7,781	2,842
HAY RIVER	8,907,922	9,370	7,121,900	623721	38710	19355	9370	12903	6452	3123	45,161	22,581	10,932
HAY RIVER VILLAGE	30,000	444	0	8196	509	254	444	170	85	148	593	297	518
JEAN-MARIE RIVER	86,426	192	5,435	6227	386	193	192	129	64	64	451	225	224
KAKISA	100	84	0	1357	84	42	84	28	14	28	98	49	98
LAC LA MARTRE	507,078	372	0	23607	1465	733	372	488	244	124	1,709	855	434
NAHANNI BUTTE	147,625	144	0	7448	462	231	144	154	77	48	539	270	168
NORMAN WELLS	100	3,110	0	50114	3110	1555	3110	1037	518	1037	3,629	1,814	3,628
PINE POINT	3,223,100	0	43,478	112949	7010	3505	0	2337	1168	0	8,178	4,089	0
RAE LAKES	215,775	444	0	14649	909	455	444	303	152	148	1,061	530	518
RAE-EDZO	2,078,715	132	38,043	75202	4667	2334	132	1556	778	44	5,445	2,723	154
SNARE LAKES	100	200	500	3238	201	100	200	67	33	67	234	117	233
SNOWDRIFT	672,896	240	0	27240	1691	845	240	564	282	80	1,972	986	280
TROUT LAKE	41,000	228	0	5098	316	158	228	105	53	76	369	185	266
WRIGLEY	476,271	324	0	21764	1351	675	324	450	225	108	1,576	788	378
YELLOWKNIFE	36,368,717	3,000	1,000,000	1335804	82903	41452	3000	27634	13817	1027	96,720	48,360	3,593
TOTAL	66,768,984	30,434	8,497,399	3004432	186462	93231	30434	62154	31077	10145	217,539	108,770	35,506

ASSUMES: 116600 BTU/GALLON OF FUEL OIL OR 36446.8 BTU/LITRE &
110000 BTU/ GALLON OF PROPANE OR 24196.6 BTU/LITRE &
17000000 BTU/CORD OF WOOD.

* - ASSUMES HALF OF ENERGY REQUIREMENT MET BY WOOD

** - ASSUMES CONSTANT BURNING EFFICIENCY RATE ACROSS FUELS

ASSUMES HARVESTING RATE IS * 3CORDS PER DAY

00-ASSUMES SPIN-OFF EMPLOYMENT MULTIPLIER OF 2.5 FOR EVERY BASE JOB IN BIOMASS HARVESTING

****
PRELIMINARY POPULATION PROJECTIONS
****

1984 DEC 20 GOVERNMENT OF THE NORTHWEST TERRITORIES PAGE 70
BUREAU OF STATISTICS

PRELIMINARY POPULATION PROJECTIONS

POPULATION BY ETHNICITY

BASE YEAR : 1983
FERTILITY/MORTALITY RATES : MODEL 2
GROWTH DUE TO MIGRATION : 0

SETTLEMENT	DEC	TOTAL	INDIAN	INUIT	OTHERS
YELLOWKNIFE	1983	10 504	1 321	167	9 016
	1984	10 751	1 368	175	9 208
	1985	10 981	1 415	183	9 383
	1986	11 180	1 460	191	9 529
	1987	11 373	1 505	199	9 669
	1988	11 593	1 551	207	9 835
	1989	11 791	1 589	215	9 977
	1990	11 945	1 610	223	10 112
	1991	12 120	1 634	231	10 255
	1992	12 296	1 674	239	10 383
	1993	12 444	1 708	247	10 489
	1994	12 589	1 737	255	10 597
	1995	12 752	1 777	263	10 712
	1996	12 907	1 815	271	10 821
	1997	13 051	1 849	279	10 925
	1998	13 191	1 887	287	11 017
	1999	13 319	1 921	294	11 104
	2000	13 458	1 960	301	11 197
	2001	13 578	1 993	309	11 276
	2002	13 718	2 026	317	11 375
	2003	13 852	2 062	324	11 466
	2004	13 992	2 102	332	11 558
	2005	14 106	2 130	339	11 637

APPENDIX D - YUKON NOTICE TO RESIDENTS

Yukon

Office of the Minister
Box 2703, Whitehorse, Yukon Y1A 2C6
(403) 667-5811 Telex 036-8-260

OFFICE OF THE MAYOR
CITY OF WHITEHORSE

TO ALL RIVERDALE RESIDENTS:

You have noticed in the past two or three years that the amount of smoke in Riverdale seems to be increasing, and that it's getting to be a nuisance. The Government of Yukon and the City of Whitehorse want to tell you more about the pollution, and ask for your help in bringing it under control. We may be able to do this without compulsory measures, but we need your co-operation.

The Environmental Protection Service of Environment Canada has been sampling the air in Riverdale for the past four winters. They report that:

- air pollution in Riverdale will exceed Canada's 'maximum acceptable' standards on 50 to 70 days each heating season, depending on the weather conditions,
- the pollution will exceed 'maximum tolerable' standards on several of these days,
- virtually all of the pollution is from wood burning appliances in people's homes,
- while it is concentrated in the newer parts of the subdivisions, it can be measured in all parts of Riverdale,
- the strength of a pollution episode depends strongly on the weather - winds, temperature and temperature inversions - but it is not yet possible to predict when pollution will be the worst.

What does the pollution mean in terms of people's health? That is a question we can not answer as yet, because we don't know enough about the air quality in the homes, schools and other buildings. But Canada's air quality standards are set by National Health and Welfare, and they chose them to reduce the risk to health, especially for the elderly and for those who have respiratory illnesses such as asthma. Riverdale's air must be clean enough for everyone's needs, regardless of their age or health.

We know that many of you burn wood to save on heating bills for oil or electricity. If we restricted the use of wood, it would mean hardship for many families. We also know that the smoke has made Riverdale a less attractive place to live and that property values have been affected. That is why we are asking for your co-operation with the action plan in this letter, so that you can do your part to reduce the pollution.

Starting before Christmas we will be broadcasting notices about air pollution in Riverdale, and explaining the 'indexing' system in the newspapers and other media. We will call another public meeting in January to describe the results of the voluntary system and to give you an opportunity to tell us what you think about this method of controlling wood smoke.

Sincerely,

Andy Philipsen, Minister
Health and Human Resources

Don Branigan, Mayor
City of Whitehorse

WOODSMOKE POLLUTION IN RIVERDALE: WHAT YOU CAN DO TO HELP

BURN YOUR WOOD CLEANLY

- burn only seasoned wood; never burn green or partly rotted wood; never burn garbage or other materials in your wood-burning appliance; do not burn coal or synthetic logs unless you are certain your appliance and chimney are rated for the additional heat produced;
- keep your cord wood dry; split wood will provide more heat and burn more cleanly;
- if starting a fire, start it small with kindling and small split pieces; always allow it to burn very hot before adding more wood;
- avoid "over stoking" your appliance; do not attempt to achieve the "long burn" rating of the manufacturer; a slow fire in an appliance holding a maximum charge of fuel not only pollutes badly, but also creates dangerous creosote formations and wastes much of the heat value of the wood;
- burn small fires, feeding them frequently; the appliance's efficiency is improved, you burn less wood for the same amount of heat, creosote deposits are reduced, and pollution drops markedly; overly large fires cause overheating of your dwelling, excessive "damping down", increased risk of chimney fire, and severe pollution;
- clean, inspect and service your appliance, smoke pipe, and chimney regularly;
- before installing efficiency enhancing or pollution reducing retrofit equipment on your wood stove, consult with the Yukon Government's Energy Branch and the City's Building Inspection Services to ensure compatibility with your stove and that safety standards are met.

LISTEN FOR THE POLLUTION INDEX

The air pollution index for Riverdale will be:

'good'	- 0 to 25
'fair'	- 26 to 50
'poor'	- 51 to 100
'very poor'	- over 100

About one day in three during an average winter will be 'poor', and on those days we would ask you to stop burning fireplaces or unnecessary heating appliances, and to try to burn your major heating appliances as cleanly as you can.

On the few days that are 'very poor', we would ask you to stop burning wood in all appliances, and switch to an alternative source of heat. Hopefully, changing weather conditions - and the co-operation of the public - should limit these pollution episodes to less than 24 hours in duration. Pollution index warnings will be more frequent during these times.

We hope that with time, as we gain more experience both with our instruments and with the Riverdale weather conditions, we will be able to give an 'air stagnation advisory', which will help you to plan when you can burn in your appliance without contributing to an air pollution problem. If everyone co-operates with this plan, we may not need the compulsory burning controls used in other cities.

APPENDIX E - PAMPHLET "LET'S CLEAR THE AIR ABOUT WOOD STOVES"

woodstove operation

Use dry, well-seasoned wood
Hardwoods such as alder or birch have a higher heat content than soft woods like spruce or pine and burn more efficiently. The energy it takes to dry the water out of green wood robs the fire of heat and greatly increases smoke. Ideally, split wood should be dried for one year to be considered well-seasoned.

Burn the wood briskly
The first 30 minutes is the period of greatest air pollution. A hot fire will heat the stove up enough to burn the wood completely and cleanly and reduce creosote build-up in the chimney.

Don't damper too far
Allow enough air into the stove to fully combust the wood. Fires that smolder due to lack of air are the worst polluters. Excessive dampering will also increase creosote build-up and the possibility of chimney fires. Read and follow the manufacturer's instructions for proper stove operation.

Don't burn garbage, newspapers, trash or coal
Garbage and trash stink when burned and many plastics release toxic gases. Coal should only be burned in specially designed stoves. Coal may contain sulphur, another pollution problem in addition to particulates from wood. Catalytic converters can be ruined by burning material other than clean wood.

Clean the chimney regularly
Inspect the inside of the flue regularly. Stack conditions are a good indicator of how well you are operating your stove. At first, check the stack once a week. The stack should be cleaned immediately if there is more than six millimetres (¼ inch) of creosote build-up. Creosote deposits, even as thin as 6 mm., can cause chimney fires.

Don't burn on poor air quality days
When the air is still, avoid using your wood stove or fireplace if possible. Return to your conventional heating method until the air quality improves in your area. If you need to burn, do it in daytime hours when dispersion of smoke is better.

other tips

Make your home energy efficient
Insulating and weatherizing your house will decrease heating needs from all energy sources, thereby reducing the size of stove needed and the amount of wood used. Call the Enersave Heatline for information and tips on making your home energy efficient.

Insulate all smoke stacks
Insulate stacks inside and outside the house to help minimize heat loss and reduce creosote build-up.

Install smoke stacks properly
Certain roof designs can cause your smoke to affect neighbouring homes. Increasing the height of the chimney may eliminate this problem.

Install an outside air intake
Supplying fresh air directly to the stove from outside the house eliminates heat-robbing drafts caused by an inside air intake.

Smoke detectors
Every home heated with wood should be equipped with at least one smoke detector. There should be one between the stove and each section of the house, particularly the sleeping areas.

Inside air quality
Vent your appliance properly to avoid smoke inside the house.

In conclusion

Householders using wood heating have a responsibility to prevent air pollution and its potentially damaging health effects. For this reason, wood heating should be avoided in densely populated areas or on poor air quality days.

By weatherizing homes, using efficient wood burning appliances and proper combustion techniques, homeowners can reduce their fuel bills, enjoy the comfort of wood heat and preserve a healthy and pollution free environment.

let's clear the air about wood stoves

For more information regarding wood heating refer to:

Heating with Wood, a homeowner's guide
Energy, Mines & Resources

Contacts in Yukon:

ENVIRONMENT CANADA
225 Federal Building
Whitehorse, Yukon
Y1A 2B6 (403) 667-8487

Conservation & Renewable Energy Branch
Energy, Mines & Resources
2079 2nd Avenue
Whitehorse, Yukon
Y1A 1B1 (403) 668-2828
Zenith 2828

Contacts in British Columbia:

ENVIRONMENT CANADA
Information Directorate
Pacific and Yukon Region
P.O. Box 1540
15th Floor
800 Burrard Street
Vancouver, B.C.
V6Z 2M7 (604) 666-6606

Conservation & Renewable Energy Office
Energy, Mines & Resources
Marlborough Mall
Room 330 - 8021 Kingsway
Vancouver, B.C.
V5H 2E5 (604) 664-7222
Toll Free 112-800-663-1280

ENERSAVE ADVISORY SERVICE (HEATLINE)
Ottawa
B.C. Residents call (toll free) 112-800-267-6583
Yukon Residents call (collect) 613-995-1901

Canada

Environment Canada
Environnement Canada

For many Canadians, wood heating provides a nostalgic and money-saving way to heat their homes, particularly in rural and northern areas. For others, wood heating is an annoying source of air pollution and associated health problems.

Since the amount of wood heating is expected to increase, it is important that clean air quality standards be maintained to protect human health and the environment.

This brochure gives householders some basic facts about the safe and efficient operation of wood stoves and answers questions about air pollution to help "clear the air."

By learning how to burn wood efficiently, householders can enjoy energy savings and reduce pollution.

what is wood smoke?

Wood smoke is a complex mixture of very small liquid and solid particles and gases, many of which are potentially damaging to human health. The main pollutants are carbon monoxide, hydrocarbons such as polycyclic organic matter, nitrogen and sulphur compounds and particulate matter.

how is wood smoke damaging to health?

Fireplaces and wood stoves can emit up to 100 times the amount of particulate matter, carbon monoxide and other gases than is released by burning oil or gas for the same amount of heat.

Gases and particulates can be carried deep inside the lungs — away from the body's ability to expel them. If inhaled over long periods of time, they can be the cause of headaches, respiratory illnesses, eye and throat irritation and are linked to an increased risk of cancer.

air pollution and wood stoves

In some towns, air pollution from wood stoves exceeds that from all other sources, including industry and automobiles. Air pollution is worst during winter months when emissions from wood stoves and automobiles are at a maximum and dispersion is limited by either cold temperatures, low winds or climatic inversions. During an inversion, warm air rises and forms a warm, stable blanket over cold ground air, trapping air pollution. Valley locations are particularly susceptible to inversions.

During times of extreme cold, below – 35° C, moisture-laden emissions from wood stoves and automobile exhausts form ice fog. Ice fog reduces visibility and suspends dangerous air pollution close to ground level.

Since light winds and air mixing are needed to disperse pollutants from the atmosphere, wood burning should be limited or avoided when stagnant air conditions prevail.

To operate wood burning appliances safely and efficiently and reduce emissions that can cause air pollution, householders should remember these guidelines.

when buying a wood burning appliance

Insurance, Fire Regulations

Householders should check their fire insurance policy and consult their local fire marshal for requirements on wood stove installation. Wood-burning appliances for mobile homes have special safety requirements. Poorly installed wood stoves are considered to be a major cause of house fires.

Buy Tested Equipment

Ensure that equipment has been tested and found acceptable for use in Canada. Choose an appliance that has been labelled by the Canadian Standards Association (CSA), Underwriter's Laboratories of Canada (ULC), or Warnock Hersey Professional Services Ltd. (WHPS)

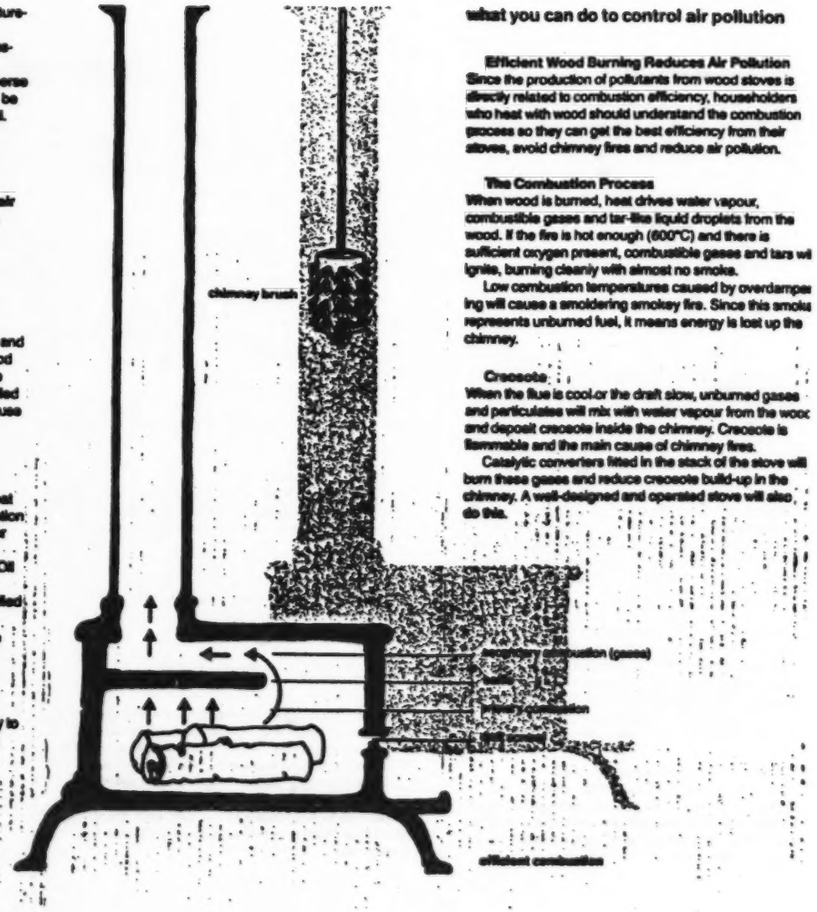
* Wood-fired appliances eligible for a COSP (Canada Oil Substitution Program) grant must have controlled combustion, a COSP acceptance number and be certified and labelled by one of the aforementioned agencies.

Note: Air-tight side drafts or stoves with baffles are considered well designed and more efficient that non air-tight or non-baffled appliances.

Choose the Right Size Stove

A stove that is too large has to be dampered constantly to keep the temperature at a comfortable level. Constant dampering increases pollutants from the stove.

A smaller stove, burning wood rapidly, produces adequate heat and less pollution.



what you can do to control air pollution

Efficient Wood Burning Reduces Air Pollution

Since the production of pollutants from wood stoves is directly related to combustion efficiency, householders who heat with wood should understand the combustion process so they can get the best efficiency from their stoves, avoid chimney fires and reduce air pollution.

The Combustion Process

When wood is burned, heat drives water vapour, combustible gases and tar-like liquid droplets from the wood. If the fire is hot enough (600°C) and there is sufficient oxygen present, combustible gases and tars wi ignite, burning cleanly with almost no smoke.

Low combustion temperatures caused by overdampe ing will cause a smoldering smokey fire. Since this smok represents unburned fuel, it means energy is lost up the chimney.

Creosote

When the flue is cool or the draft slow, unburned gases and particulates will mix with water vapour from the wood and deposit creosote inside the chimney. Creosote is flammable and the main cause of chimney fires.

Catalytic converters fitted in the stack of the stove will burn these gases and reduce creosote build-up in the chimney. A well-designed and operated stove will also do this.